



ST. ANNE'S COLLEGE OF ENGINEERING AND TECHNOLOGY

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ANGUCHETTYPALAYAM, PANRUTI – 607 106.

ACADEMIC YEAR 2017-18

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1.	Mr. S. Manavalan	New models for human and computer interaction	National Conference on Research and Development in Science, Engineering and Technology,2018 ISBN: 978-93-5254-811-8
2.	Mrs. D. Pauline Freeda	Securing an image using arithmetic coding and hyper chaotic map	National Conference on Research and Development in Science, Engineering and Technology,2018 ISBN: 978-93-5254-811-8
3.	Mr.S. Jerlad Nirmal Kumar	Trusted privacy for Mobile user Accessing the cloud computing service	National Conference on Research and Development in Science, Engineering and Technology,2018 ISBN: 978-93-5254-811-8
4.	Mr. S. Jerlad Nirmal Kumar	Privacy preserved framework for utility services in Cloud	National Conference on Research and Development in Science, Engineering and Technology,2018 ISBN: 978-93-5254-811-8
5.	Ms. V. Varalakshmi	Secure data retrieval for military network	National Conference on Research and Development in Science, Engineering and Technology,2018 ISBN: 978-93-5254-811-8
6.	Mrs. K. Poornambigai	Representaion of graphical description from natural language	National Conference on Research and Development in Science, Engineering and Technology,2018 ISBN: 978-93-5254-811-8
7.	Mrs. D. Pauline Freeda	KNN classification over symantic encryption of data	National Conference on Research and Development in Science, Engineering and Technology,2018 ISBN: 978-93-5254-811-8
8.	Mr. X. Martin Lourduraj		National Conference on Research and Development in Science, Engineering and Technology,2018 ISBN: 978-93-5254-811-8
9.	Mr. S. Rajarajan	Human activity recognition by trilateration HMSA	National Conference on Research and Development in Science, Engineering and Technology,2018 ISBN: 978-93-5254-811-8
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20.	Mrs. D. Umamaheswari		National Conference on Research and Development in Science, Engineering and Technology,2018 ISBN: 978-93-5254-811-8
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Dr. R. AROKIADASS, M.E., Ph.D.,

Principal,

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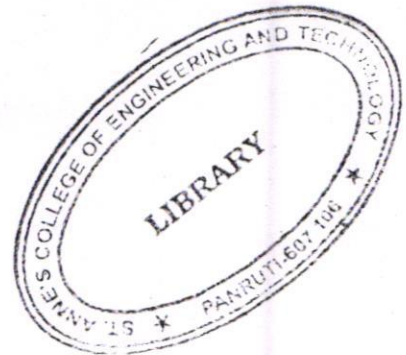
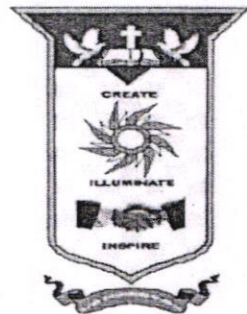
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New Models for Human- computer Interaction

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Abstract - A person's interaction with the outside world occurs through information being received and sent: input and output. In an interaction with a computer the user receives information that is output by the computer, and responds by providing input to the computer – the user's output becomes the computer's input and vice versa. Human Computer Interaction is a methodology to how the people interact with computer. This paper reviews and classifies the existing models. This paper proposes some new approaches to the models of human computer interaction.

Index Terms - HCI- Human-computer interaction.

I. INTRODUCTION

In the early days of computing, information was entered into the computer in a large mass – batch data entry. There was minimal interaction with the machine: the user would simply dump a pile of punched cards onto a reader, press the start button, and then return a few hours later.

This still continues today although now with pre-prepared electronic files or possibly machine-read forms.

Human-computer interaction is the major challenge in the era of computing. It is concerned with the joint performance of tasks by humans and machines. The human computer interaction can be described as focus the point of communication between the human user and the computer. The information between the human and computer is defined as the loop of interaction. The loop of interaction has several aspects, including Visual Based, Audio Based, Task environment, Machine environment and Areas of the interface.

According to the following statements illustrate the base of the human computer interaction:

- The Human Computer interaction depend on the users attitudinal responses.
- Using social intelligence device to get positive feedback.
- Telecommunication level interaction is always low.
- Find balance between useful interruptions and attention for co-located persons
- The low level of alert only needed.

Securing an Image Using Arithmetic Coding and Hyper Chaotic Map

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Abstract - Recently, digital image processing is widely used in all aspects of human life, such as remote sensing, industrial inspection, medical field, meteorology, communications, reconnaissance, and intelligent robots. It is more important to protect the security of image data, especially in military, commercial, and medical fields. Due to the efficient and secure transmission of an image, we have to compress and encrypt the image. Image data own the characteristics of large amounts of data, strong correlations and high redundancy. The arithmetic coding and hyper chaotic map which are used to compress and encrypt image respectively. Before compression, shuffling the pixels of plain image is done. Arithmetic coding is used to compress the image into binary data and improves the compression ratio. It compresses the image row by row which is permuted by two logistic maps before arithmetic coding. Hyper chaotic map used to encrypt the binary data and improves the security of binary data. The different parameters and initial value for chaotic map is set. The compressed and encrypted image is secure and convenient for transmission.

Index Terms - Image compression, image encryption, hyper chaotic map, arithmetic coding.

I. INTRODUCTION

1.1. Image Encryption

Image encryption is the process of encoding an image in such a way that only authorized parties can access it and those who are not authorized cannot. Encryption does not itself prevent interference but denies the intelligible content to a would be interceptor. In an encryption scheme, the intended information or message, referred to as plaintext, is encrypted using an encryption algorithm, a cipher generating cipher text that can only be read if decrypted. For technical reasons, an encryption scheme usually uses a pseudo random encryption key generated by an algorithm. It is in principle possible to decrypt the message without possessing the key, but, for a well-designed encryption scheme, considerable computational resources and skills are required. An authorized recipient can easily decrypt the message with the key provided by the originator to recipients but not to unauthorized users.

Trusted Privacy for Mobile User Accessing the Cloud Computing Services

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Abstract—In cloud computing, many resources are provided as services on demand over the internet. One of the main services provided by clouds is storage (e.g., Amazon S3), which allows users to store their large amount of data to the remote clouds without any complex management of storage hardware. But also it inherits many challenges in cloud computing. Privacy has become a considerable issue when the applications of big data are dramatically growing in cloud computing. The benefits of the implementation for these emerging technologies have improved or changed service models and improve application performances in various perspectives. However, the remarkably growing volume of data sizes has also resulted in many challenges in practice. The execution time of the data encryption is one of the serious issues during the data processing and transmissions. In this paper, we concentrate on privacy and propose a novel data encryption approach, which is called Dynamic Data Encryption Strategy (D2ES). Our proposed approach aims to selectively encrypt data and use privacy classification methods under timing constraints. This approach is designed to maximize the privacy protection scope by using a selective encryption strategy within the required execution time requirements.

Index Terms—Privacy-preserving, data encryption strategy, big data, mobile cloud computing.

I. INTRODUCTION

Due to the deployment of wireless communication technologies and the popularity of mobile devices (such as laptop, intelligent mobile phone, and tablet PC), we can access the Internet services during mobility. This brings much convenience to our daily life as we can enjoy many kinds of network services anywhere and anytime. Despite many benefits of using mobile cloud computing, there are great concerns in protecting data owners' privacy during the communications on social networks or mobile apps [11], [12]. One of the privacy concerns is caused by unencrypted data transmissions due to the large volume of data many applications

Privacy Preserved Framework for Utility Services in Cloud

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Abstract—Utility based cloud services can efficiently provide various supportive services to different service providers. Trust negotiations with federated identity management are vital for preserving privacy in open systems such as distributed collaborative systems. However, due to the large amounts of server based communications involved in trust negotiations scalability issues prove to be less cumbersome when offloaded on to the cloud as a utility service. In this view, we propose trust based federated identity management as a cloud based utility service. The main component of this model is the trust establishment between the cloud service provider and the identity providers. We propose novel trust metrics based on the potential vulnerability to be attacked, the available security enforcements and a novel cost metric based on policy dependencies to rank the cooperativeness of identity providers. Practical use of these trust metrics is demonstrated by analyses using simulated data sets, attack history data: published by MIT Lincoln laboratory, real-life attacks and vulnerabilities extracted from Common Vulnerabilities and Exposures (CVE) repository and fuzzy rule based evaluations. The results of the evaluations imply the significance of the proposed trust model to support cloud based utility services to ensure reliable trust negotiations using federated identity management.

I. INTRODUCTION

Trust negotiations are necessary to control the users' access to information resources in open systems [1]. In a trust negotiation process, two parties who are unknown to each other, establishes trust through an iterative bilateral exchange of credible digital identities. Collaborations often persist over a limited time period, and therefore, ii)organizational restrictions for inclusion of these collaborative users into their local security policies. Digital identity management (IDM) is vital to facilitate reliable and seamless trust negotiations. Among the various identity management approaches, federated identity management is considered to be more appropriate for distributed collaborative environments. During a trust negotiation process, identity providers (IDPs) verify and provide necessary digital identities upon request. Trust is used to interpret the reliability in order to convince that an entity (e.g. user, server, system component) is secure or accurate [3]. However, specific definition of trust depends on the application. In this paper, we use trust to denote the reliability of the identity providers to the CSP, in terms of the i) cooperation of IDPs in releasing identities without prolonged delays as well as ii) the ability to release identities without failure in view of potential attacks.

Secure Data Retrieval for Decentralized Delay Tolerant Military Networks

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Abstract - Mobile nodes in military environments such as a battlefield or a hostile region are likely to suffer from intermittent network connectivity and frequent partitions. Delay-tolerant network (DTN) technologies are becoming successful solutions that allow wireless devices carried by soldiers to communicate with each other and access the confidential information or command reliably by exploiting external storage nodes. Some of the most challenging issues in this scenario are the enforcement of authorization policies and the policies update for secure data retrieval. Ciphertext-policy attribute-based encryption (CP-ABE) is a promising cryptographic solution to the access control issues. However, the problem of applying CP-ABE in decentralized DTNs introduces several security and privacy challenges with regard to the attribute revocation, key escrow, and coordination of attributes issued from different authorities. In this paper, we propose a secure data retrieval scheme using CP-ABE for decentralized DTNs where multiple key authorities manage their attributes independently. We demonstrate how to apply the proposed mechanism to securely and efficiently manage the confidential data distributed in the disruption-tolerant military network.

Keywords - Access control, attribute-based encryption (ABE), delay-tolerant network (DTN), multiauthority, secure data retrieval.

I. INTRODUCTION

In many military network scenarios, connections of wire-less devices carried by soldiers may be temporarily disconnected by jamming, environmental factors, and mobility, especially when they operate in hostile environments. Delaytolerant network (DTN) technologies are becoming successful solutions that allow nodes to communicate with each other in these extreme networking environments. Typically, when there is no end -to-end connection between a source and a destination pair, the messages from the source node may need to wait in the intermediate nodes for a substantial amount of time until the connection would be eventually established.

Roy and Chuah introduced storage nodes in DTN where data is stored or replicated such that only authorized mobile nodes can access the necessary information quickly and efficiently.

Many military applications require increased protection of confidential data including access control methods that are cryptographically enforced in many cases, it is desirable to provide differentiated access services such that data access policies are defined

Representation of Graphical Description from Natural Language

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Abstract- This paper focuses on the mapping of natural language sentences in written stories to a structured knowledge representation. This process yields an exponential explosion of instance combinations since each sentence may contain a set of ambiguous terms, each one giving place to a set of instance candidates. To improve the generalization capacity while learning from a limited amount of annotated data, a new constrained learning algorithm for Bayesian networks is introduced. The effectiveness of the proposed algorithm is evaluated on a set of three stories, yielding nine experiments. Our mapping framework yields performance gains in predicting the most likely structured representations of sentences when compared with a baseline algorithm.

Keywords - Intelligent narrative, natural language processing, structured prediction, constrained learning.

I. INTRODUCTION

The narrative provides a model for communicating experience and culture. Automatically extracting structure information from narrative text is a challenging task. Since the structured representation of connected events and behaviors may involve commonsense inferences based on background knowledge, such as the semantic representation of objects, their properties and behavior, the motivations and goals behind the actions of characters, their emotional outcomes, and the actions they can undertake in the environment.

The SRL aims at a general-purpose semantic representation, i.e. it aims at providing a semantic representation at a higher-level of abstraction, while our work aims at instantiating semantic frame elements at a lower-level of abstraction, in an annotation style tailored for the narrative text.

II. LITERATURE REVIEW

Karl Pichotta and Raymond J. Mooney: Learning Statistical Scripts with LSTM Recurrent Neural Networks. describe a Recurrent Neural Network model for statistical script

KNN Classification over Semantic Encryption of Data

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Abstract - Data Mining is used for extracting potentially useful information from raw data. The integration of data mining techniques into normal day-to-day activities has become common place. Every day people are confronted with targeted advertising, and data mining techniques help businesses to become more efficient by reducing costs. Cloud computing provides a powerful, scalable and flexible infrastructure into which one can integrate, previously known, techniques and methods of Data Mining. We focus on solving the classification problem over encrypted data. In particular, we propose a secure k-NN classifier over encrypted data in the cloud. The proposed protocol protects the confidentiality of data, privacy of users input query, and hides the data access patterns. To the best of our knowledge, our work is the first to develop a secure k-NN classifier over encrypted data under the semi-honest model. a novel secure k-nearest neighbor query protocol over encrypted data that protects data confidentiality, users query privacy, and hides data access patterns. However, as mentioned above, PPk-NN is a more complex problem and it cannot be solved directly using the existing secure k-nearest neighbor techniques over encrypted data. We extend our previous work and provide a new solution to the PPkNN classifier problem over encrypted data

Index Terms – Cloud, Data mining, KNN query process

I. INTRODUCTION

Due to the rise of various privacy issues, many theoretical and practical solutions to the classification problem have been proposed under different security models. With the recent popularity of cloud computing, users now have the opportunity to outsource their data in encrypted form as well as the data mining tasks to the cloud.

Data mining is a powerful new technique to discover knowledge within the large amount of the data. Also data mining is the process of discovering meaningful new relationship, patterns and trends by passing large amounts of data stored in corpus, using

Human Activity Recognition by Triliteration HMSA

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Abstract— Elegant strategy such as Smartphone application able to give the functions of a pedometer by the accelerometer. To attain a high correctness the devices contain to be damaged on specific on-body location such as on an armband or in footwear. Usually public carry elegant devices such as Smartphone in different positions, thus making it not practical to use these devices due to the abridged correctness. Using the implanted Smartphone accelerometer in a low-power mode there an algorithm named Energy-efficient Real-time Smartphone Pedometer which accurately and energy-efficiently infers the concurrent person step count within 2 seconds with the Smartphone accelerometer. Technique involves take out 5 features from the Smartphone 3D accelerometer devoid of the need for noise filtering or exact Smartphone on-body placement and compass reading; Energy-efficient Real-time Smartphone Pedometer categorization correctness is around 94% when validated using information collected from 17 volunteers.

Index Terms— Pedometer, Accelerometer, Smartphone, Activity categorization

I. INTRODUCTION

Smart phones provide sophisticated real-time sensor information for dispensation. Researchers contain studied a large number of sensors such as accelerometer, gyroscope, rotation vector, and direction sensors in person step count projects. Of these the accelerometer is the majority precious non-transceiver sensor used to give the information for activity monitoring as it gives more information concerning movement armed forces. Therefore the core center of this system is on using solely the smart phone accelerometer for person pace count. The motivation for MBS, in contrast to LBS, includes:

1. Adapting dynamically the types of mobility information services based upon the travel mode, e.g., a pedestrian map triggered after detecting walking, shows safer places to cross roads whereas a motorist map focuses more on main road routes.
2. Mobility profile driven social and societal behaviour analysis changes via gamification and incentives, e.g., to promote greater low carbon transportation modes and low-energy transport usage.

Image-Text Matching Tasks Using Two Branch Neural Networks

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Abstract - Image-language matching tasks have recently attracted a lot of attention in the computer vision field. These tasks include image-sentence matching, i.e., given an image query, retrieving relevant sentences and vice versa, and region-phrase matching or visual grounding, i.e., matching a phrase to relevant regions. This paper investigates two-branch neural networks for learning the similarity between these two data modalities. We propose two network structures that produce different output representations. The first one, referred to as an embedding network, learns an explicit shared latent embedding space with a maximum-margin ranking loss and novel neighborhood constraints. Compared to standard triplet sampling, we perform improved neighborhood sampling that takes neighborhood information into consideration while constructing mini-batches. The second network structure, referred to as a similarity network, fuses the two branches via element-wise product and is trained with regression loss to directly predict a similarity score. Extensive experiments show that our networks achieve high accuracies for phrase localization on the Flickr30K Entities dataset and for bi-directional image-sentence retrieval on Flickr30K and MSCOCO datasets.

Index terms — Deep Learning, Cross-Modal Retrieval, Image-Sentence Retrieval, Phrase Localization, Visual Grounding.

I. INTRODUCTION

Computer vision is moving from predicting discrete, categorical labels to generating rich descriptions of visual data, in particular, in the form of natural language. We are witnessing a surge of interest in tasks that involve cross-modal learning from image and text data, widely viewed as the “next frontier” of scene understanding. For example, in bi-directional image-sentence search one aims to retrieve the corresponding images given a sentence query, and vice versa. Image captioning is the task of generating a natural language description of an input image. Motivated by the notion of creating a visual Turing test, Visual Question Answering (VQA) aims at answering freeform questions about image content. Visual grounding tasks like referring expression understanding and phrase localization find image regions indicated by questions, phrases, or sentences. To support these tasks, a number of large-scale datasets and benchmarks have recently been proposed, including MSCOCO and Flickr30K datasets for image captioning, Flickr30K Entities for phrase localization, the

Internet of things Based Smart Car Parking System

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Abstract – *The increase in the number of vehicles leads to problem in vehicles parking at an appropriate place mainly the car parking which leads to traffic congestion. This is due to the fact that the current car park facility is unable to cope up with the arrival of large number of vehicles on the road. To solve this problem we propose a new idea “Internet of Thing Based Smart Car Parking System” which helps users to find a free parking space with the help of IoT. Our project uses Infrared sensor, Arduino Uno, ESP8266-01 Wi-Fi Module and Cloud server, It also lessens human effort at the parking area such as in case of searching of free slots by the driver and calculating the payment for each vehicle using parking area. Smart Car Parking System enables continuous monitoring and managing of available parking space in real-time thereby reducing the environmental pollution.*

Index Terms— IoT, RFID, IR sensors, smart parking, slot allocation,

I. INTRODUCTION

Internet of things (IOTs) is a recent topic that plays an important role in our daily lives. IOT reduces human labor, effort, time and errors due to human negligence. With the development of modern technology, smart phones have become a necessity for every person on this planet. A smart parking system helps to monitor vehicle parking. It helps to manage parking collision among vehicles when they are parking at the same time that means it helps in synchronized parking. In IOT objects are connected to each other and exchange information from internet. Our IOT based smart parking organized the parking lot. It helps user to find a free space in parking slot. It saves user's time as well as their fuel. It helps nowadays to obtain parking spaces in metropolitan area which is very crucial. People waste money and fuel in searching for parking lot. Smart parking system gives information about parking spaces. An infrared (IR) sensor is used at each slot in parking; it tells the space availability. The information about the free or used slot sends over web page through IOT. Furthermore, we have other IOT platform like home automation, heart monitoring, any physical thing that is connected and exchanging information from internet. At present, Cisco is working very hard on IOT and probably up to year 2020 every appliance will be controlled by internet. Due to continue the growth of vehicle, it is difficult to find a parking place in a short amount of time and also it wasted a lot of fuel in searching an empty parking place. Hence, to overcome from this serious problem, we are implementing an automated parking where it can tell to user that parking space is available or not for his car. If slot is empty, they can go otherwise need search a new place instead of go and search for parking. In metropolitan area, smart car parking system becomes major point with rise numbers of

Identification of Car Parking Slot availability Using IOT

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Abstract:

This paper focus on multilevel car parking system A using internet of things by sending the status of the parking slot to the internet. IR sensor and Arduino in combination with usagé of internet of things by sending the information to the mobile phone, laptops , LCD screens ,etc..The implementation of multilevel car parking system helps us for parking more number of cars with minimum space. Our proposed system deals with information about parking slot availability using IOT. Authentication card will provided for the each car so that the authorized can access the parking system .The advantage of multilevel parking are to solve the parking issue in the urban area and also provide the security to a car. It can be used in highly populated areas such as hospitals, schools, colleges, shopping mall, cinema halls, etc.,

Keywords: *Internet of Things (IoT), Autonomous Car Parking, Arduino, ESP8266 Wi-Fi Module, IR Sensors, Servo motor.*

I. INTRODUCTION

In this age of technology, we are working in a way to reduce our effort in every possible way and the introduction of the Arduino and IoT platforms have further broadened the scope of this possibility in our everyday lives. One of the major problems that we are facing in today's over-populated society is finding available parking spots in various public places like hospitals, office shopping malls, cinema halls, courts, schools and colleges.

The statistics show that approximately 20% of all the congestion in the city is caused by frustrated drivers driving around the block searching for parking spaces.

II. PREVIOUS WORK

Various parking sensors are already installed in some of the public spaces in developed countries which use infrared sensors (hereinafter called as IR Sensors) to detect the presence of a car in a particular spot.

The motivation that drives the result is the pursuit of an alternative solution for the problem that is instead of using IR Sensors, it would be more efficient to switch to Ultrasonic Sensor which is not affected by variations in the light intensity in a particular environment. Also, instead of using the Ethernet shield or connecting it through LAN cable, a Wi-Fi module (ESP8266) is used. Thus, reducing the cost of cable, increasing the efficiency and making it more feasible to get implemented.

2.1 Using hardware: Indicators (in this case, two bulbs: 1 red and 1 green) are placed outside the parking slot, red bulb indicating an occupied parking space while the green bulb which indicates an empty space. This is done so that during the night time the driver can see from a distance that is the slot is empty or occupied.

2.2

2.3 Software (IoT): Before entering the place, the driver can check through the Internet/Mobile App that which slot or which area is empty and can directly go to that area and park his car, without anyone's

Implementing Digital FIR Filter (Using Various Windows) on DSP Processor

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Abstract. *This Work focuses on design and implementation of Digital FIR Filters using Window method. For this various windows like Rectangular, Hamming, Hanning, Blackman, Kaiser Windows are used. Then the comparison of the features of these windows is done after implementing these filters on DSP Processor TMS320C50 of Texas Instruments. The advantages of Digital filters over the analog filters are like truly linear phase response, specifications of digital filters does not vary with environmental changes, the frequency response of digital filters can be automatically adjusted if it is implemented using a programmable processor, several input signals or channels can be filtered by one Digital filter without the need to replicate the hardware, filtered and unfiltered data can be saved for further use, performance of digital filters is repeatable, and they can be used at very low frequencies found in many applications where the use of analog filters is impractical. Also digital filters can be made to work over a wide range of frequencies by a mere change of the sampling frequency. Study involves Basics of Digital Filters discussed in Literature review. Architecture of TMS320C50 is discussed & MATLAB program is developed for calculating the filter coefficients. These are used in the assembly language program, which is implemented on TMS320C50 DSP Processor. Finally the comparison of features of above said windows is made based upon the obtained results. In future scope of the work, the adaptive filtering and its advantages are discussed. Also the finite word length effects and their remedies on FIR filter performance are discussed.*

1. INTRODUCTION

Filters are characterized as one of the most effective signal processing devices. Digital filters operate in discrete domain to attain the objective of filtering. Traditionally, most digital filter applications were limited to audio and high-end image processing. With advances in process technologies and DSP methodologies the implementation of digital filters is cost-effective. They have drawn attention of many researchers from the last few decades due to their enormous applications in engineering. In control engineering, digital filters are used for system stabilization, identification and modeling [1,2]. These Digital filters not only enriches the biomedical signals such as ECG, EEG, and MRI images but are also used in high-tech lifesaving machinery which are highly useful in medical industry [3–6]. In signal processing, many applications includes removal of noise/ interference, shaping of the signal spectrum [7] and many more. Lots of applications are encountered in the field of telecommunication with improved quality and economy of service provided by digital systems applications [8]. Design of an optimal filter is an important constraint of minimization problem wherein an ideal frequency response is approximated by a finite number of continuous functions. This approximation is computed in terms of difference between the two functions and the design

Robust and Secure Video Steganography Using Matlab

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ABSTRACT: Steganography deals with hiding text, images or video within another text, image or video file. This project focuses on secure video steganography which eliminates any suspicion to the transmission of hidden messages. This is done based on multiple objects tracking (MOT) algorithm. The hiding process is performed by concealing the secret message of all motion regions in the video depending on foreground masks. Therefore, security and robustness are provided by encoding the secret message and withstanding against various attacks.

KEY WORDS: Video steganography, MOT, GMM, DWT, DCT

I.INTRODUCTION:

Steganography literally means covered writing. Information hiding: Utmost importance in today's world. Embedding efficiency, hiding capacity, and robustness are the three major requirements incorporated in any successful steganographic method. Data security basically aims at preserving the confidentiality and integrity of protecting data from unauthorized user or hackers. Steganography is the art of invisible communication.

The purpose is to hide very presence of communication embedding messages in third person cannot sense the presence of hidden messages. While cryptography method to conceal information by encrypting it to cipher text using unknown key and transmitting to intended receiver, the steganography provides further security in hiding cipher text into other cover medium. To hide secret information in some other source of information without leaving is to hide information in a way that prevents the detection of hidden messages.

The word steganography comes from the Greek steganos, meaning covered and any apparent evidence of data alteration steganography technology can be used.so more amount of information hides in a single video. Data containing both the cover signal and the embedded information is known as stego data.

FFT Approaches to Analyze the Periodic Characteristics of ECG Waveform

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Abstract:

Digital Signal Processing (DSP) Applications have gained great popularity in the study of Bio-Medical Signal Processing .DSP can be used as a tool in the era of Bio-Medical Engineering and it is used to study the continuous rhythmic periodic waveform of ECG and finding out abnormalities present in the function of the heart.DSP solves this task with great accuracy and less complexity. According to available medical research report it has been given to understand the arrhythmias caused due to cardiac abnormalities. In this project we are going to present FFT approaches to analyze the periodic characteristics of ECG waveform and design spectrum of Angina Pectoris of ECG for identifying cardiac abnormalities.

1. INTRODUCTION

Application of signal processing methods, such as filtering, Discrete Fourier Transform (DFT), Fast Fourier transform (FFT) to biomedical problems, such as the analysis of cardiac signals (ECG/EKG).

The signal processing in digital is what we are considering to implement to our ECG signals as an extra function after we finish the basic objective of the project, which is only to design, simulate, fabricate, test, and demonstrate an ECG demonstration board in analog.

1.1 DSP Techniques:

Digital signal processing and analog signal processing are subfields of signal processing. DSP applications include audio and speech signal processing, sonar, radar and other sensor array processing, spectral estimation, statistical signal processing, digital statistical signal processing, digital image processing, signal processing for telecommunications, control of systems, biomedical engineering, seismic data processing,

Design and Implementation of Anti-Collision system to prevent Train Accident Dynamically Using Embedded System

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Abstract - Railway is the most popular and friendly transportation system of the largest part of the cities in the world. Train is widely used for comfortable and safe journey in a reasonable fare. People from different professions can effort it. Almost 10,000 billion freight tonne-Kilometers and more than 5 billion Passengers of rail transport have been travelled around the world per years. The railway transportation system plays an important role for business as well as for leniency and safe travelling in modern life. But at every turn, the train is facing unexpected situation in travelling because of wrong signal, wrong track switching, insecure level crossing etc. for which collision have been occurred. As a result, lot of damages has been done in economic sector with lot of causalities which affect our progress. But we can avoid this unexpected collision and take prevention from the accident dynamically by using the collision detection technology which can be made by ultrasonic sound with a special embedded system. By using this technology can detect the obstacle and gradually slow down the speed by initiating the air brake to stop the train before the collision takes place.

Key Words: Ultrasonic Sensor, Microcontroller board, Control Device, Alarm, DC Servo motor, Embedded System.

1. INTRODUCTION

Railway is the most popular and friendly transportation system in the world. Rail transports are facing major challenges in our day to day life. Rail transport systems first appeared in England in 1820s. From 1820-2016 many evolution is occurred. At present railways is one of the most widely used transportation system in the world. Approximately 10,000 billion freight tonne-Kilometres are travelled around the world every year and more than 5 billion

Frequency and Beam Reconfigurable Monopole Antenna using VARACTOR Diode

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Abstract— A novel frequency and pattern reconfigurable monopole antenna is designed in this paper. The reconcilability is achieved by integrating an active frequency selective surface (AFSS) with feed antenna. A monopole Antenna is designed to illuminate AFSS, The smart FSS comprises a printed slot array loaded by varactors The Varactor diodes are placed in the AFSS such that the reconfigurable is achieved by switching on & off. The varactor diode the proposed design work at 2 different frequencies and power consumed is very less. Antenna design is other switches like PIN diode. A monopole antenna is designed to illuminate the AFSS. The resulting structure can operate in a frequency tuning range of 30%. By reconfiguring the different sections of active FSS cylinder into a transparent or reflector mode, the omnidirectional pattern of the source antenna can be converted to a directive beam. Experimental results demonstrate the capability of providing useful gain levels and good impedance matching from 1.7 to 2.3 GHz. The antenna offers a low-cost, low-power solution for wireless systems that require frequency and beam reconfigurable antennas. The proposed design consumes about 1000 times less dc power than the equivalent narrowband beam-switching antenna design using p-i-n diode-loaded AFSS.

Index Terms— Beam steering, frequency and beam reconfigurable, frequency selective surface (FSS), frequency tunable, reconfigurable antennas.

I. INTRODUCTION

Future wireless networks are going to evolve to provide significant improvements, such as higher data rates, reduced end-to-end latency, and lower power Consumption. Most wireless systems employ multiple antennas, which can lead to increased hardware complexity, large size, high power consumption, and high cost. Reconfigurable antennas with the capacity to electronically alter their operating modes,

An Adaptive Routing Protocol for extension of Lifetime and Coverage Area in WSN

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Abstract- The particularities of Wireless Sensor Networks require specially designed protocols. Nodes in these networks often possess limited access to energy (usually supplied by batteries), which imposes energy constraints. Additionally, WSNs are commonly deployed in monitoring applications, which may in- tend to cover large areas. Several techniques have been proposed to improve energy-balance, coverage area or both at the same time. In this paper, an alternative solution is presented. It consists of three main components: Fuzzy C-Means for network clustering, a cluster head rotation mechanism and a sleep scheduling algorithm based on a modified version of Particle Swarm Optimization. Results show that this solution is able to provide an adaptive routing protocol that offers reduced energy consumption, while keeping high- coverage area.

Keywords

Particle Swarm Optimization, Fuzzy C-Means, Clustering, Lifetime

1. Introduction

(WSN) is usually used in the most varied applications such as environmental, industrial and process monitoring. They are formed by distributed sensing devices, commonly powered by batteries that at the end of their

Analog Low Noise Amplifier Circuit Design and Optimization

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Abstract - With the increasing use of wireless communications, there emerges a trend towards integrating multiple wireless functionalities into one mobile device. Recently we have been observing a paradigm shift in the integrated wireless transceiver design where several narrow-band receivers customized for dedicated applications, e.g. cellular, wireless LAN (Local Area Network), and PAN (Personal Area Network) are replaced by one single circuit which support different standards operating on different frequency band is called—Universal Receiver. To support multiple standards which have different modulation techniques put tough performance requirement for noise, gain and matching of universal receiver design. Realizing Analog to digital converter for universal receiver for the RF signal without Low Noise Amplifier (LNA) is practically very difficult using current technology. The LNA and mixer are relaxing the stringent performance requirements of the analog to digital converter. In LNA design has performance trade-off among noise, gain, linearity, matching and power consumption. In the research designed and proposed two narrowband LNAs and three wideband LNAs for the Bluetooth, GPS, UWB and 4G technologies. Detailed analysis of all LNAs is carried out. All the LNAs design using 0.18 μ m RFCMOS model and simulate the design using Advanced Design System RF circuit simulator software.

IndexTerms—DE and PSO Algorithms.

I. INTRODUCTION

Motivation the demand of wireless transceiver RFICs is exp expanding rapidly because of its huge market ranging from pagers, cordless phones, cell phones, WLAN terminals, nodes for sensor networks and GPS to recently introduced DAB/DVB enabled PDAs [1]. These diverse range of mobile terminals have their own standard and require separate RF front-end and digital resources for baseband processing. As per today's demand modern mobile terminals should support WLAN, Bluetooth, ZigBee, GSM, 3G, GPS, LTE, IEEE 802.11a/b/g and WiMax etc. wireless communication standards. This demands the mobile terminals to be flexible in nature with low power and low cost..

Therefore, the designer is urged to integrate all radio blocks on a single chip along with hardware reuse/sharing which not only results in cost reduction due to reduced silicon area but allows exclusion of separate RF packaged chips at the same time. On-chip integration and

Analysis and Design of Circular Microstrip Patch Antenna for ISM Band Applications

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Abstract— Here we made an attempt to maximize the gain of microstrip patch antenna. To achieve this we used microstrip circular patch antenna at 5.8 GHz frequency ISM Band Application. Single FSS (frequency selective surface) substrate is used to increase efficiency. Parameters are set accordingly microstrip patch antenna with substrate layer on the basis of return loss, directivity, radiation pattern and gain. We used HFSS (high frequency structured simulator) software for simulation of antenna and to find out the results. We keep changing the design of antenna as our motive was to achieve miniature antenna with better results than conventional antenna's. Thickness of substrate has been minimized to achieve the same. Coaxial feeding technique has been used as it is easier to implement.

Keywords— Microstrip Antenna, Operating frequency 5.8GHz, Circular Microstrip patch antenna

I.INTRODUCTION

Microstrip antennas are divided into 4 different categories they are:

- Microstrip Patch antenna
- Microstrip dipoles
- Printed slot antennas
- Microstrip travelling wave antenna

Within few years microstrip patch antenna has gained lot of popularity and considered as most dynamic field in communication and being used to realize millimeter wave monolithic integrated circuits for microwave, radar, GPS antennas and communication purposes. In response to their increasing demand for compact and easy fabricated antenna with efficient results for use in various wireless communication systems, several circular antennas have been developed over the past decade. The major disadvantages of these antennas are narrow bandwidth and gain. Advantages of these Antennas are its low profile, robustness, inexpensive, light and compact design. Photo etching technology is used to fabricate antenna together with microwave circuit. It supports both linear as well as circular polarization.

Implementation of an efficient Energy Detection Technique for Spectrum Sensing in Cognitive Radio

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Abstract-The radio frequency spectrum is a scarce natural resource and its efficient use is of the utmost importance. The spectrum bands are usually licensed to certain services, such as mobile fixed broadcast, and satellite, to avoid harmful interference between different networks. Most spectrum bands are allocated to certain services but worldwide spectrum occupancy measurements show that only portions of the spectrum band are fully used. Moreover, there are large temporal and spatial variations in the spectrum occupancy. In the development of future wireless system the spectrum utilization functionalities will play a key role due to the scarcity of unallocated spectrum. Moreover, the trend in wireless communication system is going from fully centralized system into the direction of self-organizing system where individual nodes can instantaneously establish ad hoc networks whose structure can change over time. Cognitive radio, with the capabilities to sense the operating environment, learn and adapt in real time according to environment creating a form of mesh network, are seen as a promising technology. The paper presents an overview of cognitive radio; various spectrums sensing technique used in CR and also describe the state-of-the-art techniques in cognitive radio standards and regulation. In this project we have implemented and analyzed a energy detection technique for spectrum sensing in CR.

Keywords: Cognitive Radio, Spectrum Sensing, Energy Detection, Primary user, Secondary user, Threshold, Probability of detection, Probability of false alarm.

I. INTRODUCTION

With the development of a host of new and ever expanding wireless applications and services, spectrum resources are facing huge demands. Currently, spectrum allotment is done by providing each new service with its own fixed frequency block. As day passes demand for spectrum are expected to increasing rapidly and it would get in future. As more and more technologies are moving towards fully wireless system, demand for spectrum is enhancing.

Efficient edge detection algorithm for blurred images

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Abstract- Edges characterize object boundaries and are therefore useful for segmentation, registration, and identification of objects. Edge detection is the technique used for image segmentation and data extraction in areas such as image processing, computer vision, and machine vision. This paper focuses on enhancing a blurred image captured on occasions like bad weather conditions or captured during motion. Areas of high frequency is extracted from the blurred image and then processed. Consequently, the high-frequency image is divided into nine sub regions, based on a sliding window, and the rich edge region index of each region is determined. Then, the region with the richest edge information is extracted. Finally, the extracted edge region, instead of the entire motion blurred image, is used to estimate the blur kernel with L0-regularized intensity and gradient prior, and the blurred image can be restored. Experimental results show that the proposed method can improve the recovery efficiency while ensuring the recovery quality as well.

Index Terms—Image processing, Image restoration, Image quality, Motion blurred image

I. INTRODUCTION

The purpose of detecting sharp changes in image brightness is to capture important events and changes in properties of the world. Use of an edge detection algorithm to an image may significantly reduce the amount of data to be processed and may therefore filter out information that may be regarded as less relevant. If the edge detection step is successful, the subsequent task of interpreting the information contents in the original image may therefore be substantially simplified. Motion blur in images is a common phenomenon and the restoration of motion blurred images has always been a research hotspot in the computer vision field. The combination of denoising and edge detection with the estimation of motion results in an energy functional incorporating fidelity- and smoothness-terms for both the image and the flow field.

Various operators are available for edge detection namely Roberts, Prewitt, Sobel etc. Most of these partial derivative operators are sensitive to noise. Use of these masks resulted in thick edges or boundaries, in addition to spurious edge pixels due to noise. Laplacian mask is highly sensitive to spike noise. Use of noise smoothing became mandatory before edge detection, specifically for noisy images. But noise smoothing, typically by the use of a Gaussian function, caused a blurring or smearing of the edge information or gradient values.

A Survey on Smart Home Based Systems Using Wi-Fi

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ABSTRACT: *Current WiFi systems support a peak physical-layer data rate of 54 Mbps and typically provide indoor coverage over a distance of 100 feet. Conventional sensing methodologies for smart home are known to be labour-intensive and complicated for practical deployment. Thus, researchers are resorting to alternative sensing mechanisms. WiFi is one of the key technologies that enable connectivity for smart home services. Apart from its primary use for communication, WiFi signal has now been widely leveraged for various sensing tasks, such as gesture recognition and fall detection, due to its sensitivity to environmental dynamics. Building smart home based on WiFi sensing is cost-effective, non-invasive, and enjoys convenient deployment. In this paper, we survey the recent advances in smart home systems based on WiFi sensing, mainly in such areas as health monitoring, gesture recognition, contextual information acquisition, and authentication.*

Key words: IoT, Smart home, WiFi sensing

I INTRODUCTION

Smart home technology, also known as home automation, provides homeowners security, comfort, convenience and energy efficiency by allowing them to control smart devices, often by a smart home app on their smart phone or other networked device. A part of the internet of things (IoT), smart home systems and devices often operate together, sharing consumer usage data among themselves and automating actions based on the home owners preferences. Smart home enables the interconnections of ubiquitous devices planted in home appliance with sensors and actuators for automation. The thrust for smart home is an aggregation of different kinds of technologies which normally involve three layers: application layer, network layer, and perception layer.

Recent advances in wireless technology have found that the WiFi signals are sensitive enough to capture environmental dynamics thus can be used for the sensing purpose. Building a smart home based on WiFi sensing can outweigh conventional solutions. The main benefits are threefold. 1) Cost effective. WiFi sensing makes it possible to deploy sensing tasks on existing infrastructures, namely WiFi transceivers which are already ubiquitous in typical indoor settings. 2) Convenient deployment. Building supported hardware for smart home is simple and easy.

FORMULATION OF MATHEMATICAL MODEL FOR GABA IN DIAGNOSING EARLY PARKINSON'S DISEASE USING REGRESSION AND ARTIFICIAL NEURAL NETWORK

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ABSTRACT

Parkinson's disease (PD) is the second progressive movement disorder next to Alzheimer. The insufficiency of neurotransmitters called dopamine and Gamma-Amino Butyric Acid (GABA) in the area of human midbrain is taken as an accurate and reliable diagnostic tool to detect the disease at an early stage. The new machine learning techniques are coming out for improving the accuracy of diagnosis process. The proposed work focuses on formulating the mathematical model for predicting Parkinson's disease at an early stage based on two different machine learning strategies namely regression and Artificial Neural Network (ANN). Formulation of mathematical model uses the measured GABA concentration level as an output parameter and striatal binding ratio (SBR) values of caudate and putamen (left & right) as an input parameters. The Measured values of GABA concentration are used for finding the coefficients of the regression model and for training the feed forward back propagation neural network to calculate the predicted GABA. The variance between the measured and predicted values for regression and ANN are computed as an error rate. The neural network model was found to be capable of better predictions of PD in terms of GABA with minimum error rate.

Keywords: Parkinson's disease, SBR, GABA concentration level, Artificial Neural Network, Prediction model

1. Introduction

PD is a common movement disorder which disturbs human mid brain called substantia nigra. It is categorized clinically by the symptoms of resting tremor, rigidity, postural instability, bradykinesia, psychological and mental disturbances. The diagnosis of PD is easy when symptoms are full blown. However, when the disorder is mild, an accurate diagnosis is quite tough, which demands the formulation of an early detection technique for PD [1-3]. The inhibitory neurotransmitter called dopamine regulates and controls movements, motivation and cognition. Degeneration of dopamergic nerve cells along the nigrostriatal pathway affects the gait system of human [4]. Thus, calculating dopamine insufficiency in caudate and putamen of the human midbrain improves the performance of diagnostic process [5, 6].

Gamma-amino butyric acid (GABA) is also a most fundamental inhibitory transmitter in the central nervous system (CNS) and spinal cord. GABA mediates pre-synaptic inhibition

Fabrication of a Prototype Autonomous Weapon Using Quad copter for Military Application

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ABSTRACT

The concept of an Unmanned Aerial Vehicle (UAV) has largely been considered one the most innovative and advantageous military accomplishments within the past decades. UAVs, including multicopter and drones, are currently being used for two major purposes military and commercial use. Considering to commercial use a multicopter is integrated with a wireless camera for remote surveillance. This project is about fabrication of a prototype autonomous weapon using multicopter for military application. A quadcopter is built having symmetrical four arms on which a DC brushless motor with propeller is mounted on every arm. To make this quadcopter autonomous, we will be using Arduino platform to program and apply Proportional Integral Derivative (PID) algorithm to calculate the output values of the motor commands by using input values from transmitter and sensors. Inertial Measurement Unit (IMU) sensor will be giving the values regarding angle and angular velocity of the quadcopter. The quadcopter will also be interfaced with a wireless camera for the hawk view which helps in border security, surveillance, counter insurgency, attack and strike, target identification and designation and communication relay. UAVs are better suited for dull, dirty or dangerous mission .

Keyword: UAV, BLDC, Quad Copter

I. INTRODUCTION

Unmanned Aerial Vehicle (UAV), commonly known as a drones or Unmanned Aircraft System (UAS), or by several other names, is an aircraft without a human pilot aboard. The flight of UAVs may operate by wireless remote control by a human operator, or fully or intermittently autonomously by an autopilot or onboard processor. Compared to manned aircraft, UAVs are often preferred for missions that human cannot enter. Basically it originated from commercial applications, but recently expanding in military application.

IR Based Anti Piracy Screening System

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Abstract– *Cinema is a major entertainment for people in today's life. To entertain people a lot of investment is put on cinemas by the film – makers. Their effort is being ruined by few people by pirating the cinema content. They do it by capturing the video in mobile camera and upload it to websites or sell it to people and this goes on. There have been repeated attempts and pleas to kill piracy and save the film industry, members of film would have even staged protests and submitted memorandums to the government. In this paper, a technical method to prevent video recording in movie theatres is presented. An invisible light is projected from the screen to the whole audience that falls on the cameras which are optically sensitive to infra-red light inturn disturbing the acquisition functions of any camera making an illegal recording in the theatre useless.*

Keywords: *Anti-piracy, camcorders, fingerprint scanner, IR rays, screen.*

I. INTRODUCTION

In today's age the growth of the Internet has led to many new innovations in the way it is used. Internet can provide fast access to any kind of information and media, and also the copyrighted contents. "Piracy refers to the unauthorized duplication of copyrighted content that is then sold at substantially lower prices in the 'grey' market". Final copy of the movie content might get leaked before its release by the multiple teams working on them. The more common method is to film the movie inside a theatre and then uploading it on Websites or convert them to DVDs and sell them on the streets. Most box office releases are available online within a few days or even hours of the box office release.

Copyright law protects the value of creative work. Making unauthorized copies may subject one to civil and criminal liability. Night vision goggles are provided to movie hall staffs which would help them to notice any audience trying to record a movie while screening. Instead of treating every movie goer as a potential pirate, an anti-piracy screening system can be implemented in order to make the pirate copy useless as well as having no effect on the audience.

Energy efficient path detection and traffic reduction using EDAL protocol in WSN

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Abstract-The Wireless Sensor Networks (WSNs) have emerged as a new category of networking systems with limited computing, communication, and storage resources. In many sensing applications source nodes deliver packets to sink nodes via multiple hops, leading to the problem on how to find routes that enable all packets to be delivered in required time frames, while simultaneously taking into account factors such as energy efficiency and load balancing. To solve this problem one data collection protocol is developed called EDAL, which stands for Energy-efficient Delay-aware Lifetime-balancing data collection. Methods used are centralized heuristic and ant colony gossiping to find best energy efficient path. CAS (Cooperation-Aware Scheme) is used to reduce the traffic in the network.

Index Terms— Ant colony gossiping, Centralized heuristic

I. INTRODUCTION

Wireless Sensor Network (WSN) refers to a group of spatially dispersed and dedicated sensors for monitoring and recording the physical conditions of the environment and organizing the collected data at a central location. A WSN consists of few hundreds to thousands of sensor nodes. The sensor node equipment includes a radio transceiver along with an antenna, a microcontroller, an interfacing electronic circuit, and an energy source, usually a battery. The size of the sensor nodes can also range from the size of a shoe box to as small as the size of a grain of dust.

The main constraint of sensor nodes is their very low finite battery energy, which limits the lifetime and the quality of the network. For that reason, the protocols running on sensor networks must consume the resources of the nodes efficiently in order to achieve a longer network lifetime. Finding best energy efficient path using Centralized Heuristic and Ant colony Optimization. Reducing the network traffic using Cooperative Aware Scheme in Wireless sensor network.

Combining Memory Allocation and Processor Voltage Scaling for Energy-Efficient IoT Task Scheduling

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Abstract — As IoT (Internet-of-things) technologies grow rapidly for emerging applications such as smart living and health care, reducing power consumption in battery -based IoT devices becomes an important issue. An IoT device is a kind of real-time systems, of which power-savings have been widely studied in terms of processor's dynamic voltage/frequency scaling. However, recent research has shown that memory subsystems are getting reached to a significant portion of power consumption in such systems. In this paper, we show that power consumption of real-time systems can be further reduced by combining voltage/frequency scaling with task allocation in hybrid memory. If a task set is schedulable in a low voltage mode of a processor, we can expect that the task set will still be schedulable even with slow memory. By considering this, we adopt non-volatile memory technologies that consume less power than DRAM but provide relatively slow access latency. Our aim is to allocate tasks in non-volatile memory if it does not violate the deadline constraint of real-time tasks, thereby reducing the power consumption of the system further. To do so, we incorporate the memory allocation problem into the problem model of processor's voltage scaling, and evaluate the effectiveness of the combined approach.

Keywords — dynamic voltage scaling; hybrid memory; internet-of-things (IoT); non-volatile memory; real-time task scheduling

I. INTRODUCTION

Due to the recent advances in mobile networks, embedded systems, and sensor technologies, IoT (Internet-of-things) grows rapidly in various application domains such as health care, smart living, national defense, and safety management. IoT is an emerging spotlighted technology that enables the connection of sensor-attached embedded systems such as wearable devices, smartphones, or mobile appliances through wired/wireless networks. IoT devices can be considered as independent systems with separate functions, but they also collect various physical data from sensors and transfer them to other IoT devices and/or cloud

Stress and Vibration Analysis of Air Turbine Rotor for Titanium-Alloy

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Abstract - Withstanding of air turbine rotor blades for the elongations is a major consideration in their design because they are subjected to high tangential, axial, centrifugal forces during their working conditions. Several methods have been suggested for the better enhancement of the mechanical properties of blades to withstand these extreme conditions. On which CATIA V5 is used for design of solid model. ANSYS 14.0 software is used analysis the finite element model of the blade by solid brick element and thereby applying the boundary condition.

IndexTerms—: Air turbine, Blade, Hub, Deflection, ANSYS, CATIA, Titanium Alloy Ti-4Al-4V, Hs-Steel, Al-Alloy

1. INTRODUCTION

The finite element method is a numerical analysis technique for obtaining approximate solutions to a wide variety of engineering problems. Although originally developed to study stresses in complex structures, it has since been extended and applied to the broad field of continuum mechanics. That occurs in less stress and low strain in the titanium alloy gives better results when compared to Hs-Steel and Al-Alloy.

1.1 Finite Element Method

The finite element method is a numerical method that can be used for the accurate solution of complex engineering problem. It is considered to be one of the best methods for solving a wide variety of practical problems efficiently. It is method (FEM) has now become a very important tool of engineering analysis. Its versatility is reflected in its popularity among engineers and designers belonging to nearly all the engineering disciplines.

1.2 Engineering Applications of the (FEM)

Although the method has been extensively used in the field of structural mechanics, it has been successfully applied to solve several other types of engineering problem, such as heat conduction, fluid dynamics, seepage flow, and electric and magnetic fields. These applications prompted mathematicians to use this technique for the solution of complicated boundary value and other problems. In fact, it has been established that the method can be

used for the numerical solution of ordinary and partial differential equations the general applicability of the finite element method can be observing.

II. CONSTRUCTIONAL FEATURES OF AIR TURBINE ROTOR BLADE

The Air turbine obtains its power by utilizing the energy of the compressed air which is at high pressure by expanding through the several rings of moving blades, to get a high pressure in the order of 15 bar. Working air medium which is essential for expansion a compressor is required. At the same time blade can rotate 50000 rpm. The quantity of Compressed air and speed required are more, so generally a centrifugal or axial compressor is required. The turbine drive the compressor so it is coupled to the turbine shaft, there were no losses in either component, the power developed by the turbine can be increasing the volume of working air medium at constant or increasing the pressure adjusted by the air turbine valve will be under control.

2.1 Rotor Blade Design

1. Nomenclature

E-Young's Modulus, δ - Deflection, ω -Angular velocity, m-Blade mass, d-Bore diameter, D-Disc diameter, N-Speed of Turbine in rpm, T- Disc thickness

Air turbine blade details:

D=70 mm, N=50000 Rpm, T=18mm, d=15mm: No of blade: 27, Tip to Tip Diameter = 100 mm.

2. Calculations Loads on Blade

The blade loads applied on the rim of the disc are calculated below:

$$\begin{aligned} 27 \text{ Blade mass} &= 0.117 \text{ kg} \\ \text{Speed, N} &= 50000 \text{ RPM} \\ \text{Angular Velocity, } \omega &= \frac{2\pi N}{60} = \frac{2\pi \times 50000}{60} = 5236 \text{ rad/s} \\ \text{Total number of blades, n} &= 27 \\ \text{Mean radius of blade, r} &= 42.5 \text{ mm} \\ \text{Centrifugal load of blades} &= m r \omega^2 = 0.117 \times 0.0425 \times (5236.0)^2 = 130.0 \text{ kN} \end{aligned}$$

Table 1: Mechanical properties of Titanium Alloy, Hs-Steel & Al-Alloy.

Material	Tensile Strength, MPa	Density kg/m ³	Specific Strength MPa-m ³ /kg(σ/ρ)
Ti-4Al-4V	890	4600	0.1935
Hs-Steel	1667	7850	0.2084
Al-Alloy	510	2800	0.1821

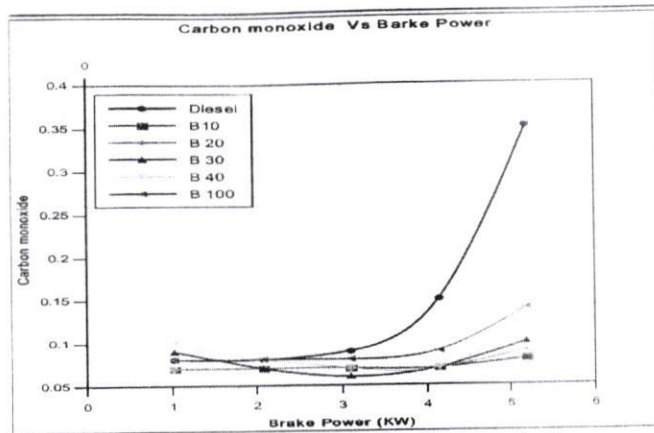


Fig.6. Variation of Carbon Monoxide with Brake Power.

IV. CONCLUSIONS

Based on the experimental results the following conclusions are arrived:

1. The brake thermal efficiency of the Prosopisjuliflora oil is lower than the sole fuel.
 2. Smoke density is higher for Prosopisjuliflora oil up to 75% load, beyond that marginal reduction in the smoke density.
 3. Unburned hydrocarbon emissions for B100, B40 and B30 blends are lower level.
 4. Exhaust gas temperature is higher for B20 and lower for B100 when compared with sole fuel.
 5. NOx emission is lower for all blends when compared to sole fuel.
- The best blend ratios are B20 and B30 based on the performance, emission and combustion characteristics.

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Performance solar cells – using mercury Nano tubes

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Abstract - In our world there are many resources available in the earth. We are utilizing some of the resources in our daily life. One type of main resources is solar energy. Man has needed and used energy at an increasing rate for his sustenance and well being even since he came on the earth a few million years ago. Man required energy and then he used wind and water. And then man was using sun which was supplying all the energy needs of man either directly or indirectly and that man was using only renewable sources of energy. The secret behind this extra capacity lies in mercury compound nanotubes, because of their structure, exhibit electrical and optical properties, which help in the absorption of solar energy and its conversion to electrical energy. Researchers have long dabbled with nanotube research to find an effective absorption material.

“Mercury nanotubes can absorb around 95 per cent of the solar spectrum and could act as effective absorption material.”

I. INTRODUCTION

Sun is the ultimate source for all forms energy, which is over a hundred times larger than the earth in size and is located at a distance of 150 million KM from the earth. Solar energy is a very large inexhaustible source of energy. The power from the sun intercepted by the earth's approximately $1.8 \cdot 10^{11}$ MW which is thousands times larger than the present consumption rate on the earth of all commercial energy sources. This makes its one of the most promising of the unconventional energy sources. The first solar cell was constructed by Charles First in the 1880's. The word of Ruseell Oh! in the 1940's, researcher Gerald Pearson, Calvin Fuller and Daryl Chapin created the silicon solar cell in 1954.

II. CHARACTERISTICS:

The usable voltage from solar cells depends on the semiconductor material. In silicon its amount up to 0.5V. Terminal voltage are only weakly dependent on light radiation. While the current intensity increase with higher luminosity. A sun ray emitted from the sun takes about 9 minutes to reach the earth. Sun is a fusion reactor which emitting $3,800 \text{ million}^4$ watts of energy. But the earth receives only half of this amount, which is 20,000 times the energy requirement of the world. The temperature of the sun is 15 million degree Celsius, and on the surface it is about 6000 Kelvin.

3.2 Additional Inlet

There is an additional inlet provided at one side which is shown in fig 3, the additional path takes the back pressure into the substrate. Here from this new inlet the toxic content are forced into the substrate, the top most layer of the substrate is subjected to catalytic redox reaction.

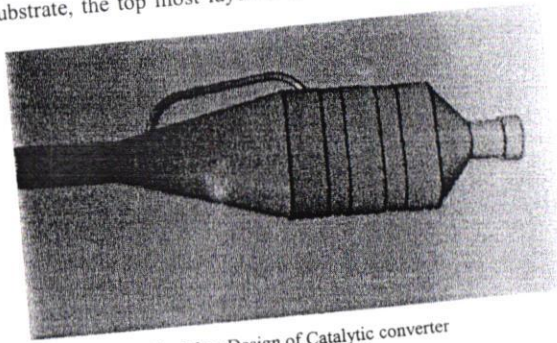


Fig 4 New Design of Catalytic converter

IV. RESULTS AND DISCUSSIONS

The fluid flow inside the catalytic converter is discussed here; the non uniform flow inside the converter is due to the flow separation at the inlet divergence section. The Pressure at inlet increases because of the substrate, which is placed at the path of flow. The above design will reduced the back pressure and capable of utilizing the substrate at its maxima.

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Investigation Characteristic of Diesel Engine fuelled by non edible oil.

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Abstract - This paper aims at investigating the performance and emissions characteristic of diesel engine fuelled by prosopisjuliflora oil. The PJSO (ProsopisJuliflora Seed Oil) namely PJS10, PJSO20, PJSSO30, PJSSO40 and PJSO100 were prepared by mixing respectively 10%, 20%, 30%, 40% and 100% of the PJSO with 90%, 80%, 70% 60%and 0% of diesel by volume. Fuels were tested in a mono cylinder diesel engine for their performance as fuel. Engine test results showed comparable performance for all the PJSO with BD (base diesel). At the maximum power output the brake thermal efficiency was found as 27.6%, 25.2%, 27.0%,24.7%and 23% respectively with PJS10, PJSO20, PJSO30, PJSO40 and PJSO100 where as it was 33.0% with BD. There is a considerable reduction in smoke and NOx emissions with the emulsions of PJSO as compared to BD at all power outputs. It was concluded that PJSO obtained from ProsopisJuliflora can be used up to 30% by volume as partial replacement of diesel by making emulsions with comparable performance with diesel. To use PJSO as soul fuel, the fuel and engine need further modifications.

Keywords: ProsopisJuliflora, Base Diesel, Engine performance, Emissions,

1. INTRODUCTION

Utilization of biomass energy as alternative fuel for compression ignition engine finds very attractive and has greater scope especially in developing and under developed countries due to the fast depletion, cost and environmental pollution from fossil fuels. Mechanical expression oil finds simple and very attractive process in extracting oil from ProsopisJuliflora. Investigations reported that blends of ProsopisJuliflora obtained from Mechanical expression with diesel resulted in comparable thermal efficiency and emissions with diesel. ProsopisJuliflora is a tree originated from Mexico and South America. Particularly in the southern regions of India the availability of ProsopisJuliflora seeds is very high. It finds no useful applications. Producing bio oil from these seeds can offer production of energy from waste. This method can certainly reduce the waste disposal. In addition, the environment can be maintained as clean. In the first phase of the work bio oil was produced from Mechanical expression of ProsopisJuliflora seeds. Properties were studied to know its suitability as fuel for diesel engines. Some of the properties of the bio oil can be seen in Table 1.

Table 1.Properties of Fuels

Properties	Neat	Neat PJSO	PJSO10	PJSO20	PJSO30	PJSO40
Density (kg/m ³)	840	1060	868	895	922	949
Flash Point (oC)	52	112	70	79	88	97
Fire Point (oC)	58	120	79	87	95	103

Design for Maximum Utilization of Substrate in Catalytic Converter

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Abstract- The source of pollution and global warming is air pollution. It is to be noted that air pollution is mainly caused by the toxic gases from the exhaust of the automobiles. Only 30 percentage of the fuel is converted into energy source to run the engine remaining 70 percentage of fuel is of un burnt hydrocarbon, carbon monoxide and nitrogen oxides. This toxic content is reduced by the invention of catalytic converter. Here the performance of the catalytic converter is studied and analysis of fluid flow is done. This project deals with the different inlet cone angle of catalytic converter to study the amount of conversion taking place inside the converter after maintaining uniform flow. The uniform flow inside the converter is achieved by increasing the cone angle of the converter. By utilizing the maximum amount of substrate life span of the converter will be increased. It helps to design a better converter model so that it may be beneficial for the customer in performance.

Key words – carbon monoxide, Inlet cone Angle, Nitrogen oxides, pressure, Uniform flow.

1. INTRODUCTION

This paper deals with the study of flow inside the catalytic converter; flow inside the converter is non uniform due to the geometry of the catalytic converter. Analysis of real time catalytic converter is more expensive and if there is any error we have to change the whole model. By using CFD (Computational Fluid Dynamics) Analysis it is easy to spot the errors and rectifying it in an easy way. Catalytic converters are made of substrate at the centre and through which the conversion of pollutant will take place [2-4]. When the burnt gases enter into the catalytic converter of certain velocity it will directly hit the substrate at the centre and chemical reactions will take place. The distance between the substrate and the exit of the inlet cone is less so the gas hit the centre portion of the substrate. By this only the centre portion of the substrate is reacted to the inlet gases, so the flow separation at the inlet is not sufficient

expand the flow in all the surfaces of the substrate so that there will be uniform flow inside the converter. Back pressure is the factor which affects the conversion rate of the redox reaction if back pressure increases it leads to failure of the engine.

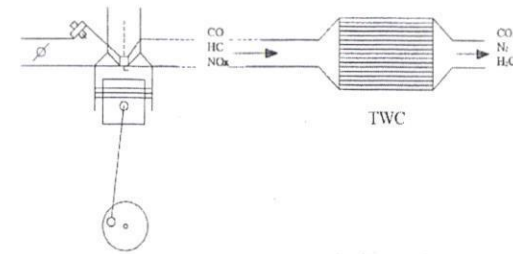


Fig 1 Catalytic converter

1.1 Catalytic Converter

A catalytic converter is an emissions control device which is used in vehicles that converts toxic pollutants in exhaust gas to less toxic pollutants by catalytic reaction (oxidation or reduction) [1]. Catalytic converters are used in IC engines fuel by either petrol (gasoline) or diesel including lean burn engines. The catalytic converter was invented by Eugene Houdry, a French mechanical engineer in 1950. Houdry concerned about the smoke stack exhaust and automobile exhaust in air pollution and founded a company, Oxy-Catalyst. Houdry first developed catalytic converters for smoke stacks called cats. Then he developed catalytic converters for warehouse forklifts that used low grade non-leaded gasoline.

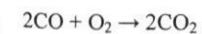
1.2 Catalytic Reaction

There are two types of catalytic converter used in automobiles. This is classified on basis of type of catalytic reaction taking place in the catalytic converter. They are 2 way catalytic converter and 3 way catalytic converter.

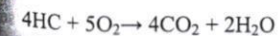
1.3 Two Way Catalytic Converter

In two way catalytic converter, it will control the emission of two different toxic sources. The carbon monoxide and hydrocarbons will be converted into carbon dioxide and water [2].

- Oxidation of carbon monoxide to carbon dioxide:



- Oxidation of hydrocarbons to carbon dioxide and water:



The two way catalytic converter is superseded by three-way converters because of their inability to control oxides of nitrogen.

1.4 Three Way Catalytic Converter

The oxides of nitrogen are more toxic than carbon monoxide and hydrocarbons, to control the toxic content of nitrogen oxides effectively with the carbon monoxide and hydrocarbons, three-way converters are designed and used in the automobile industries [2].

Table 3. Bladed Disc Vibration Modes and Frequencies

Mode No	Frequency, Hz	Mode Shape
1	5130.4	First Diametral
3	5536.6	Second Diametral
5	5789.4	First Circumferential
7	8512.3	Third Diametral

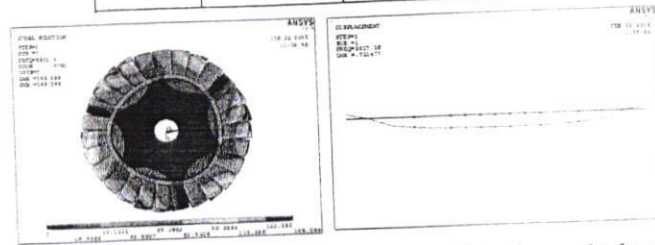


Fig: 3.4: Third Diametric Mode shape Disc Vibration and bending mode shapes

Burst Margin = $N_B / N_D = \sqrt{(0.75 * UTS) / \sigma_{ave}}$
 Where N_B - the burst speed; N_D - the design speed; σ_{ave} - average tangential stress
 The average tangential stress of the air turbine disc spinning at 50,000 rpm is estimated at 113.0 MPa. Then the burst margin is, $\sqrt{(0.75 * 890) / 113.0} = 2.43$
 That is, the burst speed is 2.43 times the design speed, a huge margin.

V. RESULT AND DISCUSSION

The stresses, deflections and vibrations are obtained by modeling in blade are shown in Figure 3.1 and 3.5. Maximum stresses and strains are observed at the turbine blade and upper surface along the blade roots in three different mesh size of construction i.e., Low, Medium and High. It is found that the overall stresses and deformation induced in the turbine blades. High mesh size has lesser stresses and deformation. The maximum stress in the model is less than maximum allowable stress. In vibration analysis three diametric mode shape having high frequency when compared to First, second diametric and First circumferential mode. The burst speed is 2.43 times the design speed so the design is safe. The Titanium alloy, Ti-4Al-4V, is chosen as the disc material for its density is moderate and the yield strength is comparable to that of ferrous alloy. The aerospace industry make uses the Titanium alloys extensively and quite commonly available.

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Analysis Of Strength In Unidirectional GRPF Based Fiber Orientations Under Static Loading Using Ansys

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Abstract - The Composite materials have found widespread applications in various fields of engineering such as aerospace, marine, automobile and mechanical applications. The strength of the composites are depends on two factors which are fiber orientation and length. In our project we are analyzing the effect of fiber orientation in a rectangular composite lamina under transverse static loading by using the finite element method. The results are obtained with the help of five different angle of orientation of GRPF/epoxy. For analysis ANSYS software were used. By comparing the results of five different orientations finally conclude the better one which will utilize full strength of the fiber composite. It is observed that the stress value is maximum of 14384 N/mm² while considered the boundary condition 2 at 30°. Also the stress value is minimum of 412 N/mm² while considered boundary condition 4 at 45°. It is also observed that displacement value is maximum of 125.409 mm while considered boundary condition 2 at 60°. From the result it is observed that the orientation at 30° with boundary condition 2 is safe while comparing other boundary conditions.

KEYWORDS: Glass reinforced plastic fiber, Epoxy, Stress, ANSYS.

1. INTRODUCTION

Composites are a combination of two or more constituent materials with significantly different physical or chemical properties. The performance of composites is superior to their constituent materials acting alone. The characteristics of resultant composite material are totally different from the individual constituents and unique. Within the composite, the different materials are apart and they do not dissolve or blend into each other.

In composites a distinct reinforcement is distributed in a matrix or binder or resin. The matrix material surrounds the reinforcement materials. Here the strength and stiffness of load bearing fibers are imparted to matrices to provide a good combination of strength and toughness of the resultant composite material. In general, fibers are the principal load-carrying members, while the surrounding matrix keeps them in the desired location and orientation, and protects them from environmental damages due to elevated temperatures and humidity.

Fillers are added to reduce the cost and increase the modulus. They also reduce the mould shrinkage and control viscosity. They provide smooth surface to composite produced. Also tougheners, colorants, flame retardants, ultraviolet absorbers, coupling agents, lubricants, heat stabilizers, and forming agents may also be added to the matrices.

Design and Analysis of Composite Spur Gear

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Abstract- Engineering components made of composite materials find increasing applications ranging from spacecraft to small instruments. Many types of gears use composite materials, however little literature is available on their use. In this project results obtained by static stress analysis of composite gears using a three-dimensional finite element approach are presented. Performance of these Composite gears are presented and compared with widely used steel Spur Gears. By introducing Composite materials, we are going to estimate the strength / weight ratio and also the stress induced during operation.

I. INTRODUCTION

Gearing is one of the most effective methods for transmitting power and rotary motion from the source to its application with or without change of speed or direction. Gears will prevail as a critical machine element for transmitting power in future machines due to their high degree of reliability and compactness. The rapid development of heavy industries such as vehicle, shipbuilding and aircraft industries require advanced application of gear technology.

A gearbox consists of a set of gears, shafts and bearings that are mounted in an enclosed lubricated housing. They are available in a broad range of sizes, capacities and speed ratios. Their function is to convert the input provided by the prime mover into an output with lower speed and corresponding higher torque. In this thesis, contact stress analysis of Spur gear is studied using finite element analysis.

The crucial requirement of effective power transmission in various machines, automobiles, elevators, generators, etc has created an increasing demand for more accurate analysis of the characteristics of gear systems. For instance, in automobile industry highly reliable and lightweight gears are essential. Furthermore the best way to diminution of noise in engine requires the fabrication of silence gear system. Noise reduction in gear pairs is especially critical in the rapidly growing today's technology since the working environment is badly influenced by noise.

The most successful way of gear noise reduction is attained by decreasing the vibration related with them. The reduction of noise by vibration control can be achieved through a research endeavor by an expert in the field. The finite element method is proficient to supply this information but the time required to generate proper model is a large. Therefore to reduce the modeling time a pre-processor method that builds up the geometry required for finite element analysis may be used, such as Pro/Engineer, CatiaV5. Pro/Engineer can generate three dimensional models of gears. In Pro/Engineer the generated model geometry is opened in ANSYS for analysis. The major cause of vibration and noise in a gear system is the transmission error between the meshing gears. By definition transmission error is the difference between the theoretical and the actual position between driving gear and the driven gear. It can be defined also as the amount by which the ratio at a given point in a revolution departs from the correct ratio. For this reason, with prior knowledge of the operating

conditions of the gear set it is possible to design the gears with minimum vibration and noise Gear analysis can be performed using analytical methods which required a number of assumptions and simplifications which aim at getting the maximum stress values only but gear analyses are multidisciplinary including calculations related to the tooth stresses and to failures like wear.

1.1 .SPUR GEAR

Spur gears are the most common type of gears. They have straight teeth, and are mounted on parallel shafts. Sometimes, many spur gears are used at once to create very large gear reductions.

Spur gears are used in many devices that you can see all over HowStuffWorks, like the electric screwdriver, dancing monster, oscillating sprinkler, windup alarm clock, washing machine and clothes dryer. But you won't find many in your car.

II. SELECTION OF MATERIALS

The gear material should have the following properties:

- High tensile strength to prevent failure against static loads
- High endurance strength to withstand dynamic loads
- Low coefficient of friction
- Good manufacturability

Generally cast iron, steel, brass and bronze are preferred for manufacturing metallic gears with cut teeth. Where smooth action is not important, cast iron gears with cut teeth may be employed. Commercially cut gears have a pitch line velocity of about 5 meter/second. For velocities larger than this, gear sets with non-metallic pinions as one member are used to eliminate vibration and noise. Non-metallic materials are made of various materials such as treated cotton pressed and moulded at high-pressure, synthetic resins of the phenol type and rawhide. Moisture affects rawhide pinions. Gears made of phenolic resins are self-supporting on the other hand other two types are supported by metal side plates at both ends of the plate. Large wheels are made with fretting rings to save alloy steels. Wheel centre is commonly cast from cast iron. The ring is forged or roll expanded from steel of the respective grade specified by the tooth design.

2.1 GEAR MATERIAL

Gears are available in diverse material specification based on their applications. They are made of plastic, steel, wood, cast iron, aluminium, brass, powdered metal, magnetic alloys and many others. The most important gear materials are listed below:

- Steel Gears
- Aluminium Gears
- Wood Gears
- Powdered Metal Gears
- Copper Gears
- Brass Gears
- Cast Iron Gears

2.2 COMPOSITE MATERIAL

A combination of two or more materials (reinforcing elements, fillers, and composite matrix binder), differing in form or composition on a macro scale. The constituents retain their identities, that is, they do not dissolve or merge completely into one another although

- MNTS have Very High Tensile Strength
- MNTS are Very Elastic ~18% elongation to failure
- MNTS have High Thermal Conductivity
- MNTs have a Low Thermal Expansion Coefficient
- MNTs are Good Electon Field Emitters

VI. INDIA

Reliance industries limited plans to set up large electrification programmed at the community and village levels in Maharashtra in 2009-2010. The project succeeded in providing lighting to about 14,000 holders in over 84 villages in the districts of nandurbar, thane, dhule, Amravati, Nasik, Kolhapur and Chandrapur.

The Andhra Pradesh government's plans to develop the state into a major solar hub in the country is progressing a cluster of solar farms at kadiri in avantapur district, 5000 acres have been earmarked in kadiri which would now be referred to as the "solar city". Four companies namely Hyderabad-based LANCON and TITAN ENERGY, and US based SUN BORNE and AES SOLAR together pledged investment to the tune of Rs. 3000 crore to set up 2000 MW of solar based power generation facilities in the solar city. The Andhra Pradesh government is preparing a solar policy for the state which would be announced soon.

The Hyderabad expected to generate 3 GW of solar power in the next 7-10 years in the FAB CITY.

VII. CONCLUSION:

The progress in science and technology is a non-stop process. As the technology grows day by day, we can imagine about the future in which thing we may occupy every place. The principle of the development of the science is that "NOTHING IS IMPOSSIBLE". So we shall look forward to a bright and sophisticated world.

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GREEN CONCRETE FROM WASTE MATERIALS

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Abstract - Continuous increase in production of cement causes large amount of carbon dioxide emission which results in green house effect. In order to overcome this problem many researchers have put in their efforts to achieve optimum strength of concrete by replacing cement with fly ash, when it combine with alkaline solution to produce Geopolymers concrete(GPC). GPC is an improved way of concreting execution made by complete elimination of ordinary Portland cement. GPC were synthesized from low calcium fly ash, activated by combination of Sodium Hydroxide and Sodium Silicate solution. This report is an attempt to find out suitable utilization of fly ash by studying the compressive strength of GPC and to observe durability characteristics of GPC. In this experimental study different concentrations of alkaline liquid are being used. Mix samples of different molarities were prepared to study the influence of alkaline solution on compressive strength of GPC. Increased alkaline solution concentration proved to have positive effect on Geopolymerization process and this is revealed by the improved compressive strength

I. INTRODUCTION

The global demand of cement for construction of infrastructures is continuously increasing in order to maintain the ongoing growth and accommodate the needs of the increasing population. OPC has been traditionally used as the binder in concrete. About 1 tonne of carbon dioxide is emitted into the atmosphere in the production process of 1 tonne of cement. This makes a significant contribution to the global greenhouse gas emission. Therefore, development of alternative binders utilising industrial by-products is necessary to reduce the carbon footprint of the construction industry. Geo polymer is an emerging alternative binder for concrete that uses by-product materials. A base material that is rich in Silicon (Si) and Aluminium (Al) is reacted by an alkaline solution to produce the geopolymer binder. Source materials such as fly ash, metakaolin and blast furnace slag can be used to make geo polymer. Fly ash blended with blast furnace slag and rice husk ash has also been used as the base material for geopolymer. The product of the reaction is an inorganic polymer which binds the aggregates together to make geopolymer concrete. The coal-fired power stations worldwide generate substantial amount of fly ash as a by-product that can be efficiently used in geopolymer concrete to help reduce the carbon footprint of concrete production.

The results of recent studies have shown the potential use of heat-cured fly ash based geopolymer concrete as a construction material. As a relatively new material, it is necessary to study the various properties of GPC as compared to the traditional OPC concrete in order to determine its suitability for structural applications. The ongoing research on fly ash-based geopolymer concrete studied several short-term and long-term properties. It was shown that heat-cured geopolymer concrete possesses the properties of high compressive strength, low drying shrinkage and creep, and good resistance to sulphate and acid. Geopolymer concrete was found to have higher bond strength with reinforcing steel and relatively higher splitting tensile strength than OPC concrete. Geopolymer concrete beams and columns were tested to failure and they showed similar or better performance as compared to OPC concrete members. Heat-cured geopolymer concrete showed higher residual strength than OPC

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Mechanical And Tribological Analysis of Sic And Fly ash Reinforced Aluminium6063 Hybrid Metal Matrix Composites

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Abstract - In the present study the mechanical properties and wear behavior of aluminium alloy 6063 reinforced with SiC particulate and further addition of fly-ash particulate fabricated by stir casting process is investigated. The results of the Brinell hardness test shows that, the hardness of the composite material are improved on increasing weight fraction of the reinforcement. The wear distance and frictional properties of hybrid metal matrix composite are studied by performing dry sliding wear test using a pin on disk wear tester. The experiments to be conducted at a constant sliding velocity of 0.314m/s and sliding distance of 188.4mm over a various load of 3,4,5kg for addition of particulate weight fraction of SiC 5% and increase in weight fraction by 4%, 9% & 14% fly-ash

KeyTerms— Dry sliding wear; Aluminium alloy-6063 hybrid composite; Brinell hardness, wear mechanism.

INTRODUCTION

Composite Materials in general are well established engineering materials with most of them possessing the advantages of higher specific weight and specific modulus and also better thermal stability, fatigue properties and wear resistance compared to many of the metals and alloys. Metal matrix composites (MMCs) are the forerunners amongst different classes of composites. Over the past two decades metal matrix composites (MMCs) have been transformed from a topic of scientific and intellectual interest to a material of broad technological and commercial significance MMCs offer a unique balance of physical and mechanical properties. Aluminium based MMCs have received increasing attention in recent decades as engineering materials with most of them possessing the advantages of high strength, hardness and wear resistance. The stir casting method is widely used among the different processing techniques available. Stir casting usually involves prolonged liquid-reinforcement contact, which can cause substantial interface reaction.

Charles et al reported that the wear and hardness of aluminium alloy hybrid (Al alloy/Silicon Carbide (SiC)/fly-ash) composites were enhanced on increasing the volume fraction of SiC. Basavarajappa et al. revealed that the mechanical properties of aluminum alloy (Al2024) reinforced with SiC and graphite particles increased predominantly with the increase in volume fraction of reinforcement. Anandra et al. reported that the properties of Al-4.5% Cu alloy composite with fly ash as reinforcement increase with increase in the fly ash content. Sudarshan et al. studied characterization of A356 Al - fly ash particle composites with fly ash particles of narrow range (53- 106µm) and wide size range (0.5-400 µm). They reported that addition of fly ash lead to increase in hardness, elastic modulus and 0.2% proof stress. They also concluded that composites with narrow size range fly ash particle exhibit superior mechanical properties compared to composites with wide size range fly ash particles. Hayrettin Ahlatci et al. [11] investigated the mechanical properties of Aluminium Silicon with 60 volume % SiC composites and

Analysis of Touch Down Point and Renewable Energy Generation in Aviation

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Abstract - The increase in demand for power unlocked the gates of many alternative energy resources like solar, wind and tidal. But these sources are seasonal and uncertain. This has made the private organizations to generate their own electric power. In this concept, the airport management that has developed new area miniaturization to overcome the uncertainty to produce power. The low power wind turbine (LPWT) is installed on the sides of runway to acquire power during aircraft landing and takeoff. The second comes is the touchdown point which is analyzed manually in the existing system. And the communication between the pilot and monitoring room is very difficult to attain on runway. The proposed communication system that have covered all the future needs of Traffic Control (ATC) and Air Traffic Management (ATM) are controlled using Embedded Micro Controller (EMC) and automated for achieving the exact point of touchdown.

Index Terms— LPWT, ATC, ATM, EMC.

I. INTRODUCTION

The increase in demand for power has become more in day to day life. Rising demand for electricity made the advancement in finding the alternative generation of power resources for the future generations. Energy harvesting system has become more essential in all the developing countries. There are many alternative energy resources like solar, wind and tidal which has become seasonal and during the uncertainties it is much more difficult to generate power with all enhanced power quality. This made the radical shift for the private organization to generate their own electric power as their business goals as a result of deregulation, open access, and privatization, is causing a significant review of network design and operating practices. The resultant separation of production, supply, bulk transmission, delivery (distribution), and metering into different businesses has sharpened the focus of these organizations.

Power Quality (PQ) is also a major issue in the generation and there are also many challenges in developing new alternative power generation but maintenance can be done easily with the centralized method. Network control and automation will play a key role

enabling the network owners to adapt to the changing situation and opportunities to achieve generation of alternative power generation. To overcome the uncertainty to produce power the airport management has developed a new concept for power generation with new area miniaturization.

Runway excursions at landing is considered as a major threat to aviation safety as they account for approximately 25% of all incidents and accidents in air transport, and 96% of all runway accidents. The main issue in the Landing is regarding the touchdown process which is done manually these days. Landing of aircraft involves human life and that could create many risk and accidents. There were many research made in the development to automate the touchdown point for the aircraft landing but it was not achieved. There must be certain awareness and issues to promote the runway safety measures and also to develop communication guidelines for safety landings.

II. EXISTING SYSTEM

2.1 Touchdown point

The existing system uses a normal power supply for the runway power management and more energy is required to make the lighting system effective during night times. The communication with the C- band is at higher rates but the touchdown point is done manually through Aero MACS. There are more difficulties in analyzing the speed of the aircraft between the runways from the point of touchdown. There are chances of angle deviation from touchdown point which leads to overshooting of runways. Improper monitoring of the taxiways could lead to accidents and collision of aircraft.

2.2 Aero MACS Communication

Aero MACS is based on a specific commercial profile of the Institute of Electrical and Electronics Engineers (IEEE) 802.16 standard known as Wireless Worldwide Interoperability for Microwave Access or WiMAX. To help increase the capacity and efficiency of the nation's airports, a secure wide band wireless communications system is proposed for use on the airport surface.

As the communications, navigation, and surveillance (CNS) facilities for air traffic management (ATM) at an airport grow in number and complexity, the need for communications network connectivity and data capacity increases. Over time, CNS infrastructure ages and requires more extensive and expensive monitoring, maintenance, repair or replacement. Airport construction and unexpected equipment outages also require temporary communications alternatives.

2.3 Runway Power Generation

Runway power generation is done with the normal distribution generation supply from the substation, feeders and transmission lines. Airport runway airstrips need more energy during the night time lighting for the aircraft landing and takeoff. When more power is consumed then there will be energy demand and crisis for the commercial and residential purposes. There are so many alternative methods for generation of power but those have some seasonal with the weather conditions. More advancement must be made to have an alternative sources of energy.

CONTROL OF HYBRID AC/DC MICRO GRID INVOLVING ENERGY STORAGE, RENEWABLE ENERGY AND PULSED LOADS

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Abstract—This paper proposes the coordinated control of a hybrid AC/DC power system with renewable energy source, energy storages and critical loads. The hybrid micro grid consists of both AC and DC sides. A synchronous generator and a PV farm supply power to the system's AC and DC sides respectively. A bidirectional fully controlled AC/DC converter with active and reactive power decoupling technique is used to link the AC bus with the DC bus while regulating the system voltage and frequency. A DC/DC boost converter with a maximum power point tracking (MPPT) function is implemented to maximize the energy generation from the PV farm. Current controlled bidirectional DC/DC converters are applied to connect each lithium-ion battery bank to the DC bus. Lithium-ion battery banks are used as energy storage devices that serve to increase the system stability by absorbing or injecting power to the grid as ancillary services. The proposed system can function in both grid-connected mode and islanding mode. Power electronic converters with different control strategies are analyzed in both modes in detail. Simulation results in MATLAB Simulink verify that the proposed topology is coordinated for power management in both AC and DC sides under critical loads with high efficiency, reliability, and robustness under both grid-connected and islanding modes.

Index Terms—Ancillary services, battery bank, critical load, energy management, hybrid AC/DC power system, micro grid, solar energy.

I. INTRODUCTION

Hybrid power systems are growing in popularity due to the increase in microgrid implementation of renewable power conversion systems connected to low voltage AC distribution systems. This growth has also been attributed to the environmental issues caused by conventional fossil fueled power plants [1][3]. Furthermore, DC grids are resurging due to the development of new semiconductor technology and sustainable DC power sources such as solar energy. There has also been an increase in DC loads, such as plug-in electric vehicles (PEVs) and light emitting diodes (LEDs), connected to the grid to save energy and decrease greenhouse gas emissions. The PEVs can be viewed as energy storage devices when they are parked in the garage, allowing them to increase the stability and efficiency of the micro grid they are connected to. One of the major technical challenges in micro grids is the interconnection of a pulse load which can cause voltage collapse, oscillation of the angular velocity in the generators, and degradation of overall system performance.

Researchers have proposed several ideas and models relating to renewable energy sources and their scheduling and PEV charging optimizations to the feasibility of PEV vehicle-to-grid (V2G) services [4]-[6]. However, these models only propose the idea without thorough analysis of the energy conversion between the AC and DC sides. Researchers have also proposed several ideas and models of AC/DC micro grids [7]-[9], but their systems operate without the influence of the critical loads. The stability and coordination control of power electronics devices during grid-connected and islanding with the influence of critical loads is still an open issue.

At the same time, various utility grids and some hybrid micro grids are increasing the penetration of renewable energy resources [10]-[11]. This growth in renewable sources increased the challenge these grids will meet due to the intermittent nature of wind and solar power. This can quickly add up to system instability that can force generators to ramp up and down wildly, push grid protection gear into states not meant to handle, or force the wind and solar generator to shut off altogether [12]. Hybrid power systems face far more challenges when operating in islanding mode than they do in grid connected mode. In islanding mode, the AC side can no longer be viewed as an infinite bus, which results in load shedding adversely affecting the frequency and voltage of the system. If the system has a high penetration of renewable power, the situation can be even worse. At any time, power flow should be balanced between the AC and DC sides to maintain stability on both sides of the grid. Also, both reactive and active power in the AC side of the system should be balanced to keep the frequency and voltage stable.

In this paper, a hybrid AC/DC micro grid with solar energy, energy storage, and pulse load is presented. This micro grid can be viewed as a PEV parking garage power system or a ship power system that is sustainable energy and is influenced by pulse load. The system operation and power converters are studied in both grid-connected and islanding model. The power flow control of the system configuration and modeling of the PV farm and battery banks are presented in Section II. Section III demonstrates the simulation results for the converters in grid-connected mode and islanding mode are presented in Section III. Section IV demonstrates the simulation results that verify the proposed topology and control can increase system stability and efficiency under the influence of a pulse load. Finally, conclusions

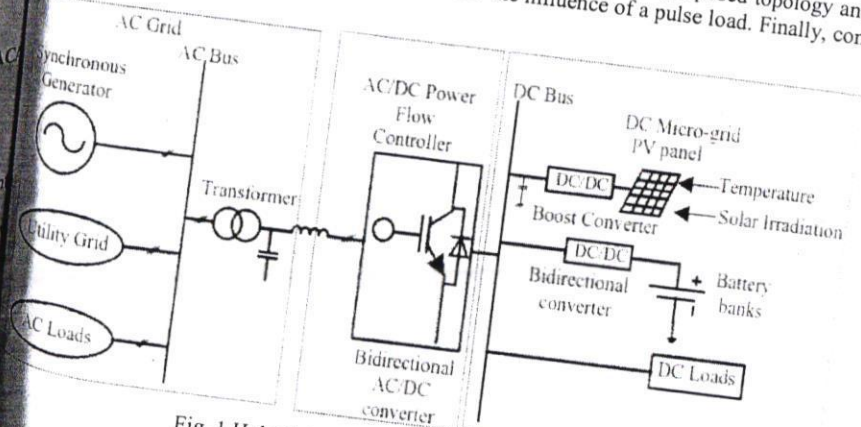


Fig. 1 Hybrid AC-DC microgrid power system.

SYSTEM CONFIGURATION AND MODELING

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Real-Time Multi-Sensor Based Fire Detection and Notification System Using Fuzzy Logic

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Abstract - This paper presents the design and development of a fuzzy logic multi-sensor fire detection system and notification system. Until recently, most consumer grade fire detection system relied solely on smoke detectors. The protections provided by these have been established to be limited by the type of fire present and the detection technology at use. The problem is further compounded by the lack of adequate alert and notification mechanisms. A fuzzy logic system was implemented using Arduino development board with inputs from an MQ2 Smoke sensor, a TMP102 temperature sensor and DF Robot flame sensor. The output of the detection system is sent over SMS (Short Message Service) using a SIM900 Global System for Mobile Communication (GSM) module to the system and the house owner or caretaker in real-time. The efficiency of the notification system employed by standard fire detection and the multi-sensor remote based notification approach in this paper showed significant improvement in the form of timely detection, alerting and response.

Index Terms—real-time, fire detection and fuzzy logic.

I. INTRODUCTION

An overhead electrical appliance, a burning splinter or a burning cigarette or just about any of these can trigger a fire. FIRE is a phenomenon combustion manifested in flame and temperature. There are three main elements required for fire to exist, these are oxygen, solid materials and flammable liquids. These make up what is known as the fire triangle. The proportions of each of these elements determine the nature of the fire. With fire and some of its by products being employed in a lot of useful applications such as cooking, power generation and the manufacturing process, among other, it has the potential to also cause havoc.

According to the Center of Fire Statistics of International Technical Committee for the Prevention and Extinction of Fire (CTIF), between 70,000 and 80,000 deaths occurs annually due to the fire outbreaks the beginning of the 21st century. The system employed an adaptive fuzzy classification system to automatically generate a rule base on data from the three sensors. The fuzzy logic to fire detection was adopted because it simplifies the fusion of data from the multiple sensor thereby it easier to analyze the sensor data.

Most existing fire detection systems automatically actuate an audible alert via a siren or a strobe light on detection fire. Others however require manual actuation of the fire alarm using a button or a break glass station. Remote notification has been done traditionally using

Wireless Fuzzy Controller for Drip Irrigation using Raspberry Pi and GSM

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Abstract - This paper focus on determining the humidity and temperature of the soil using Raspberry Pi controller. The project designed using MATLAB 10, fuzzy logic and Simulink tools books the temperature and soil moisture sensors are used for detect the water quantity present in agriculture and water level sensor used for detecting water level in tank the level gauge interfaced by electronic circuit worked as signal conditioner circuit the water from tanks controlled by solenoid valve which actuated by relay circuit open and close as the microcontroller output then the water transmitted to roots zone using pipes line for irrigation process. The temperature sensor and humidity sensor will measure both the moisture and temperature in the soil. If the water level is found less, it will be corrected automatically using the relay through Raspberry Pi controller. If any disturbance is found in the field the notification will be sent as message through Global System for Mobile communication (GSM) and the recorded video is sent through mail. And to remove the disturbance manual inspection should be carried out.

IndexTerms— component; formatting; style; styling; insert (key words)

1. INTRODUCTION

The population growth and environmental change both are the most challenges for the ministry agriculture and the governments, many researchers developed in this area including, food production, saving water, and reducing the pollution to protects our environments from the pollutions that produced by the man in through industry and energy production. Universities, research center, institute and the governments through the world they published many articles and paper in the field of irrigation management, irrigation control, solar energy, water safety, environmental management and, yields, vegetables and agriculture production management. With the rapid development of agriculture in China, crop growth

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Bridgeless SEPIC Converter With a Ripple-Free Input Current

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Abstract - Conventional power factor correction (PFC) single-ended primary inductor converter (SEPIC) suffers from high conduction loss at the input bridge diode. To solve this problem, a bridgeless SEPIC converter with ripple-free input current is proposed. In the proposed converter, the input bridge diode is removed and the conduction loss is reduced. In addition, the input current ripple is significantly reduced by utilizing an additional winding of the input inductor and an auxiliary capacitor. Similar to the conventional PFC SEPIC converter, the input current in a switching period is proportional to the input voltage and near unity power is achieved. The operational principles, steady-state analysis, and design equations of the proposed converter are described in detail. Experimental results from a 130 W prototype at a constant switching frequency of 100 kHz are presented to verify the performance of the proposed converter.

Index Terms— Bridgeless converter, coupled inductor, power factor correction (PFC), single-ended primary inductor converter (SEPIC).

I. INTRODUCTION

According to the demand on high efficiency and low harmonic pollution, the active power factor correction (PFC) circuits are commonly employed in ac-dc converters and switched-mode power supplies. Generally, these kinds of converters include a full-bridge diode rectifier on an input current path so that conduction losses on the full-bridge diode occur and it will be worse especially at the low line. To overcome this problem, bridgeless converters have recently been introduced to reduce or eliminate the full-bridge rectifier, and hence their conduction losses [1]-[13]. A bridgeless boost converter is widely used in advantages of reduced input current ripple, but its output voltage should be higher than the peak voltage of the input voltage [1]-[6]. Relatively low output voltage of PFC converters is required in many applications such as low-voltage switched-mode power supplies. PFC buck converters are more suitable for these applications due to their low output voltage. A bridgeless buck converter was proposed in [7] and [8]. Like conventional PFC buck converters, the output voltage of the converter proposed in [7] and [8] is lower than the peak value of the input voltage. However, since the input current of the PFC buck converter has lead angles during the time intervals when the input voltage is lower than the output voltage, there is a strong tradeoff between power factor and output voltage selection. On the other hand, a SEPIC PFC converter can provide a high power factor regardless its output voltage

Bumpless Control for Reduced THD in Power Factor Correction Circuits

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Abstract-It is well known that power factor correction (PFC) circuits suffer from two fundamentally different operating modes over a given AC input cycle. These two modes, continuous conduction mode (CCM) and discontinuous conduction mode (DCM), have very different frequency-response characteristics that can make control design for PFC circuits challenging. The problem is exacerbated by attempts to improve efficiency by dynamically adjusting the PWM switching frequency based on the load. Adjusting the PWM frequency based on the load limits controller bandwidth and restricts dynamic performance. Prior work has made use of multiple controllers; however, they have not addressed the discontinuity (bump) that exists when switching between controllers. In this paper, bumpless controllers will be synthesized for a 750 watt, semi-bridgeless PFC for the CCM-DCM operating modes.

Index Terms-Bumpless Control, Switched Control, CCM-DCM, Power Factor Correction, Efficiency, Distortion

1. INTRODUCTION

Power factor correction circuits should conserve energy and have a high power factor, as a matter of course. In the commercial marketplace, certifying a product with an energy-saving program differentiates that product and offers a competitive advantage. Two examples of energy-savings certifications are the 80 PLUS program that requires 90% efficiency at a 0.2 per unit (p.u.) load, and the ENERGY STAR version 5.0 standard that requires

power factor of at least 0.65 at a 0.1 p.u. load. Researchers have devised control strategies that may be used to meet these requirements, and typically use multiple controllers [1], [3], [4], [5].

The salient features of these approaches is to partition the PFC operation into discrete regions based on load, CCM-DCM operation, or other criteria; synthesize a controller for each region; and switch between the controllers based on the operating region. Switching between controllers will result in a discontinuous signal that can degrade performance, as illustrated in Fig. 1.1 and Fig. 1.2.

This discontinuity may be addressed using bumpless controllers [6]. In the remainder of this paper, bumpless controllers will be introduced, the DCM-CCM models for the inner current loop will be used to illustrate the significant differences between the plant in the two operating modes, two bumpless controllers will be synthesized for the two operating modes, the bumpless controllers will be tested in simulation, and the bumpless controllers will be implemented in hardware.

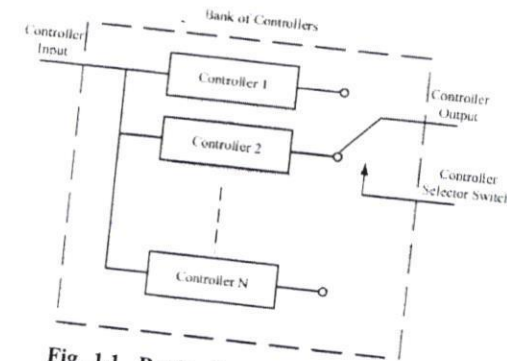


Fig. 1.1 Bank of selectable controllers.

It is assumed that each controller is optimized for a given operating range and selected when operating in that range. The output may have large discontinuities. As shown in Fig. 1.2, it illustrates the hypothetical discontinuity when switching between two controllers at $t = t_0$.

MONITORING AND CONTROLLING ENERGY METER BY USING POWER LINE COMMUNICATION

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Abstract - Energy Meter monitoring and controlling can be achieved by implementing a power line based communication system. It can provide easy access to get information on home energy consumption in real time, automatic calculation for energy consumed and monitoring of power theft by consumers. This project mainly deals with two major modules. Home section Module and Energy Board Module. Each Module consists of an advanced power control planning engine, a device control module, a power resource management server. A slave microcontroller is to be kept at each house for constant power monitoring and control of relays connected to the appliances and a master microcontroller that receives the signals from the slave microcontroller. One of the easiest solutions for this is by using power line communication. PLCC is the communication technology that enables sending data over existing power cables. This means that with just power cables running to an electric device, one can power it up and at the same time control the device in full manner. The major advantage of PLCC is that it does not need extra cables, it uses existing wires. Further communication of important information is also enabled in this system via power line.

Index Terms - PLCC, Home section module, Energy Board Module Microcontroller, Relays.

I. INTRODUCTION

Energy consumption and monitoring is an important issues and toughest task for the people of energy board session. In the current scenario of technical development, there is a high need for controlling and monitoring the energy calculation and that we are utilizing in our day to day life. The remedy for such a situation is in our own hands, if we could control these appliances by transmitting signals just like transmitting electrical signals from our home to the energy board session. This project is mainly implemented for the purpose of managing home energy utilization. The aim of the project is to measure and monitor consumption of allocated energy for a month to a consumer by the electricity board, and automatically calculate the amount for the energy consumed by using electronic devices allocated to each house. The system can monitor the power usage and power theft. The system also possesses a part which checks power theft by the consumer and automatically cuts off this supply and re permits only when user stops stealing energy. This activity is also reported to the energy board section to take necessary action.

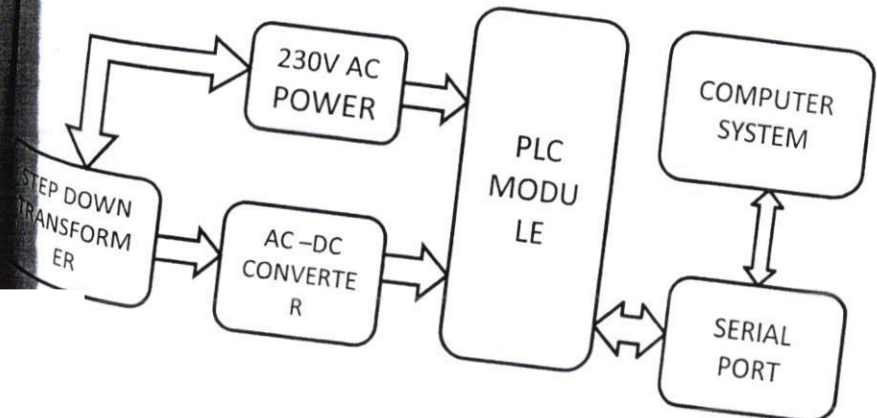
The conventional method of electricity billing is discrete, inaccurate, costly, slow and lack flexibility as well as reliability. It involves a person from the distribution unit reading the number of units of electricity consumed in the energy meter, conveying this information to the distribution unit and then preparing the bill according to the units consumed for a fixed amount of time. This can prove quite tedious as it involves various tasks like reading, then preparing the bill. Still accuracy cannot be guaranteed as there can be human errors in the reading. Despite this, the task of billing for every consumer is a time consuming job for the distribution grid. To eliminate all these problems, the most convenient method are making the whole system was controlled and monitored using power line communication. The concept of power line communication is used for the transfer of data between consumer and utility. Power line communication uses high power line for the communication. The data is transmitted at a higher frequency than that of the transmission frequency. The main advantage of this is that no additional transmission line is required for the transmission of data. A power line communication module is provided at the consumer as well as the utility side. A microcontroller is provided at each consumer to manage the different functions to be performed like keeping track of energy consumption by checking the calibrate LED of the energy meter. Also the system gives the user real time information about the units he consumed for a month. Thus by using power line communication we can monitor the usage of devices and easily calculate the amount of energy used by the circuit at the consumer end to the energy board session. Hence in this project we are encapsulate the process of control, monitoring, messaging through power line communication from a centralized control.

II. BLOCK DIAGRAM REPRESENTATION

The block diagram consists of 2 sections.

2.1 ENERGY BOARD SECTION

- ✓ Step down transformer (230 v to 12v supply)
- ✓ AC To DC Converter
- ✓ Computer system
- ✓ A PLC modem is employed as the communication module
- ✓ Serial Port
- ✓ 230 V AC Power supply



4.2 Software Requirements

Front End: Visual Basic 6.0 version
Back End: Embedded C Keil Software

V. RESULT

The accurate point of the touchdown zone is analyzed with the given software then the power generation is done with the help of piezoelectric sensor.

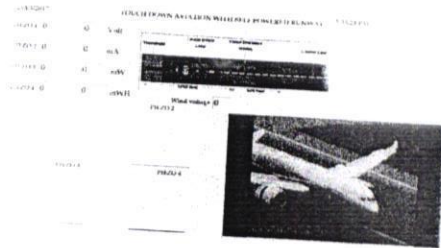


Fig. 5.1 Simulation VI.

Result CONCLUSION

This project can be implemented in metro airports to accomplish green and clean energy harvesting system with the self-powered runway with the automated touchdown zone. It uses touchdown sensors to automate the aircraft landing and power is generated with the pressure and impact from the vibration during landing. This is the efficient way of using the alternative source of power generation and it can be made with centralized distribution to all the other commercial and residential purpose from the power generated in airport. This project will surely be a complete resolution for the existing system with the improved efficiency and automation for the social and safety welfare of the country.

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Tuning Controller Parameters and Load Frequency Control of Multi-Area Power System by Group Search Optimization Technique

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Abstract - This paper presents the setting of the controller parameters using Group search optimization (GSO) and its application to the load frequency control (LFC) of a power system from several sources that have different production sources as hydropower, thermal and gas power plants. A controller (PID) proportional integral derivative is used for tuning and analysis of the proposed model. The optimization of Group search optimization (GSO) has been developed for the appropriate control settings for optimal performance. The superiority of the proposed approach was demonstrated by comparing the results with the optimum output feedback controller algorithm used for the same power systems. The comparison is made through various performance measures such as excess, time and standard error criteria of power frequency and tie-line after a disturbance step (SLP) load perturbation. Note that the dynamic performance of the proposed controller is improved by using GSO. Further-more, it also notes that the proposed system is robust and unaffected by the change of the charge state, the parameters of the system and the size of SLP.

IndexTerms—PID and GSO Algorithms.

INTRODUCTION

The problem of controlling the actual output power generating units in response to changes in the frequency of the exchange system and tie-line power within specified limits is known as load frequency control (LFC). In general, it is considered as a part of automatic generation control (AGC) and is very important in the operation and control of power systems. Energy systems on a large scale usually consist of control zones or regions that present coherent groups of generators. The control area may have a combination of thermal, hydro, gas, nuclear and renewable sources of energy. Researchers around the world are trying to propose several strategies for LFC power systems in order to maintain the system frequency and tie line flow in their programmed values during normal operation and during all perturbations. Paper is literature that most of the works of LFC were carried out in two thermal but it can make the transient response worse. Derivative control has the effect of increasing the system stability by reducing excess, and improved transient response. Proportional integral controllers (PI) are now more often used in the industry type. A control with the derivative mode (D) is used when: not a fast system response is required, the disturbance and noise are present during operation of the process and there are long

IMPROVED POWER GENERATION IN PHOTOVOLTAIC SYSTEMS BY USING ANTLION OPTIMIZATION (ALO) ALGORITHM

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Abstract - This project proposes the design of Maximum Power Point Tracking (MPPT) based on Antlion Optimization Algorithm (ALO) for standalone PV system. A complete model of the Antlion Optimization Algorithm (ALO) for the maximum power point tracking for standalone PV system is compiled and loaded on the MATLAB simulation software as well as Raspberry Pi kit. A novel nature inspired algorithm ant lion optimizer (ALO) is recently developed which is motivated from the hunting mechanism of ant lions. Inherent steps of hunting prey such as the random walk of ants, building traps, entrapment of ants in traps, catching preys, and re-building are simulated to find the optimal solution of real life problems. The effectiveness and performance of the proposed Antlion Optimization Algorithm (ALO) based of Maximum Power Point Tracking (MPPT) for standalone Photo Voltaic (PV) system will be analysed in both simulation and hardware. Maximum power point tracking (MPPT) techniques are used in photovoltaic (PV) systems to maximize the PV array output power by tracking continuously the maximum power point Tracking (MPPT) which depends on panels temperature and on irradiance conditions the antlion optimization algorithm (ALO) more advantage compared P&O. The antlion optimization algorithm (ALO) is high dynamic performance, improve tracking performance, and better control for this application.

IndexTerms—PV, MPPT and ALO Algorithms.

I. INTRODUCTION

Maximum power point tracking (MPPT), an electronic system that operates the photovoltaic modules in a manner to extract the maximum power from the system. MPPT is not a mechanical tracking that the modules to make them point directly at the sun. The output of solar module is a function of solar irradiance, temperature. In a (power-voltage or current-voltage) curve of a solar panel, there is an optimum operating point such that the PV delivers the maximum possible power to the load. The power delivered from or to a device is optimized where the derivative of the IV curve is equal and opposite the I/V ratio. The antlion optimizer (ALO) is a meta-heuristic that mathematically models the iteration of ants and antlions in nature. A variety of different maximum power point tracking control techniques in the literature have been proposed and implemented. Comparison is done

providing the ON/OFF switch in between the PWM generator and the boost converter. Nowadays, solar photovoltaic (PV) energy systems are becoming popular and frequently using on commercial as well as residential level. Moreover, technology related to PV array is also growing and trying to extract maximum power from the PV panel. Since, the characteristic of the PV panel is no linear in nature so, PV characteristic consist of a single point SVP power is maximum, that is known as Maximum Power Point Tracking (MPPT). Therefore, to operate at MPP, it need an MPP tracking (MPPT) algorithm. The 'perturb and observe (P&O)', 'incremental conductance', 'hill climbing' and beta factor, based MPPT are few techniques which are highly suitable for find the MPP of PV characteristic, but the condition needs a uniform panel condition. However, in real life, the environmental and panel condition are not uniform.

A literature review on the MPPT reveals that various soft computing techniques have been employed for research the MPP, namely as Fuzzy logic, neural network, particle swarm optimization (PSO), improved PSO flashing fireflies optimization, colony of foraging ants algorithm. In this paper the ant lion optimization which is inspired to the hunting behavior of the ant lion. Here the prey selection behavior of the antlion is improved by using rank based selection technique. The highly appreciable merits of ALO algorithm is, the requirement of small population and performance do not depend on the initial value as well as a dependency on the algorithm specified parameters are less. Therefore, it is highly suitable online searching and creates a very less computational burden. In this work, these merits of the ALO algorithm during MPPT tracking is demonstrated on fluctuating solar insolation and temperature conditions (like a rainy season). Moreover, the MPPT searching performance is demonstrated through simulation as well as by the test (hardware) results and proven by comparing with actual MPP.

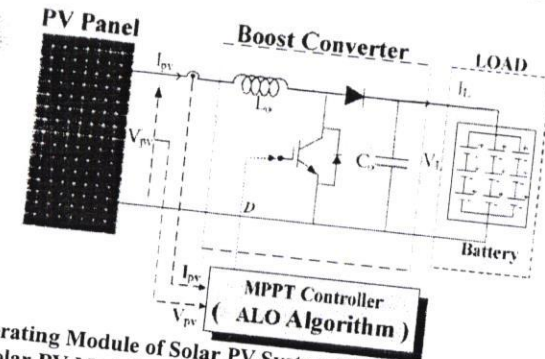


Fig 1.1 Operating Module of Solar PV System With Boost Converter and Load
Here for modeling, a single diode model is taken and shown in 2(a). the mathematical formulation of the output current (IPV) of the PV module is described as,

$$I_{pv} = I_{ph} - I_{diode} \left[e^{\frac{V_{pv} + I_{pv} R_s}{N_s q A k T}} - 1 \right] - \frac{V_{pv} + I_{pv} R_s}{R_{sh}} \quad (1)$$

where, I_{ph} is the photovoltaic current, I_{diode} is cell reverse saturation current or diode leakage current, V_{pv} is the module output, ϕ (0.221Ω) and ϕ (415.5Ω) are equivalent series and parallel resistance, NCS is the number of series cells, Q is the charge (of an electron)

Phosphors for White light emitting diode applications.

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Abstract

For the first time, $\text{NaLa}(\text{WO}_4)_2:\text{xEu}^{3+}$ ($x = 0.01, 0.05, 0.07, 0.09, 0.11$) red phosphors were synthesized using the simple mechanochemically assisted solid state meta-thesis (SSM) reaction method at room temperature and the luminescence properties as a function of Eu^{3+} ion concentration was investigated. The characteristics of the phosphor materials were analyzed using X-ray diffraction (XRD) and Photoluminescence (PL) spectroscopy. For 9 mol % of Eu^{3+} concentration, the phosphor shows an intensified excitation peak at 396 nm indicating a strong absorption. The PL emission spectra of $\text{NaLa}(\text{WO}_4)_2:\text{Eu}^{3+}$ phosphor showed an intense peak at 615 nm (red) which corresponds to ${}^3D_0 \rightarrow {}^7F_2$ transition of Eu^{3+} . The CIE colour coordinates of the $\text{NaLa}(\text{WO}_4)_2:0.09 \text{Eu}^{3+}$ red phosphor coincide very well with the standard values of NTSC.

Key words: Solid state meta-thesis reaction; $\text{NaLa}(\text{WO}_4)_2$; activator; Photoluminescence; Red phosphor; White-LED;

1. Introduction:

Light emitting diodes (LEDs) have attracted great attention as an illuminator for solid state lighting since 1993. Compared with the conventional fluorescent lamps, solid state lighting technology has the advantages of low energy consumption, environmental protection and efficient output [1,2]. The commercially available tricolor phosphors for White LED are $\text{Y}_2\text{O}_3:\text{Eu}^{3+}$ for red [8], $\text{BaMgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$ for blue [9] and $\text{ZnS}(\text{Cu}^+, \text{Al}^{3+})$ for green [10]. While comparing with blue and green phosphors, the thermal and chemical stability of

sulphide based red phosphors is inadequate. They show poor absorbance in near UV region and their efficiency is also approximately eight times lesser than blue and green phosphors for white LED applications [11]. Therefore, now-a-days, special attention is focused on discovering an alternative novel red phosphor which is thermally and chemically more stable and also shows better luminous efficiency. In the recent years, an increasing attention is focused on $\text{NaLa}(\text{WO}_4)_2$ as host matrix for luminescent ions due to its good chemical and thermal stability and good luminescence properties. $\text{NaLa}(\text{WO}_4)_2$ has a tetrahedral (Td) symmetry [10,21]. Based on these investigations, in this paper, $\text{NaLa}(\text{WO}_4)_2:\text{Eu}^{3+}$ ($x = 0.01, 0.05, 0.07, 0.09, 0.11$) phosphors were prepared by mechanochemically assisted solid state meta thesis reaction at room temperature for the first time. The structural and optical properties of the materials were studied in detail.

2. Experimental

2.1. Synthesis

The starting materials, LaCl_3 , Na_2WO_4 , EuCl_3 (99.99%), were used without further purification. Stoichiometric amounts of raw materials LaCl_3 , Na_2WO_4 , EuCl_3 were mixed and were milled for a period of one hour in a planetary ball mill Pulverisette 7 (FRITSCH). Milling was carried out in two grinding vials of 15 ccm volume containing ball with diameter of 12 mm. The resultant powder was washed with double distilled water to remove sodium chloride that was the by-product of the reaction and then dried at 70 °C for 2h in a muffle furnace in air and sieved. At long last, the productive red phosphor materials were gotten

2.2. Characterization

X-ray powder diffraction (XRD) analysis was out using Pan Analytical X'pert pro x-ray diffractometer with Cu K-alpha radiation ($\lambda = 1.5406 \text{ \AA}$) at a scanning rate of 0.02° per second. The XRD patterns were obtained in the range of $0^\circ \leq 2\theta \leq 70^\circ$ and were compared with the JCPDS data. The measurements of PL and photoluminescence excitation (PLE) spectra were performed by a Jobin Yvon Fluorog-3-11 Spectrofluorometer at room temperature with 450W xenon lamp was used as the excitation source (200-700 nm). The excitation and emission slit width were set to 2 nm. All spectroscopic measurements of the phosphors were carried out at room temperature.

Results and discussion:

communication, school administrators should understand what is to be communicated and do it effectively. This is because instructions need to be passed intelligibly to people to arouse their interest and support. If communication is ambiguous it can lead to chaos. The principal must come down to use the simplest language so as not to lose the meaning of what is being communicated. The idea of using a "third party or middle man" in communicating vital information often leads to distortion especially when the information being communicated is not of much interest or benefit to the "middle man". At times, the information being communicated may be of interest and he may have his own hidden agenda for introducing another dimension to the issue which on the long run may not be to the advantage of the school.

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Synthesis And Structural Studies On Zinc(II) Dithiocarbamate Complexes And Their Utility For Sensing Anions

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Abstract

$Zn(fcpedtc)_2$ (1) and $[Zn(fcpedtc)_2(py)]$ (2) $Zn(fchpedtc)_2$ (3) and $[Zn(fchpedtc)_2(py)]$ (4) [where, fcpedtc= N-methylferrocenyl-N-(2-phenylethyl)dithiocarbamate-S,S'] and fchpedtc= N-methylferrocenyl-N-(2-thiopheneethyl)dithiocarbamate-S,S'] were synthesized. A single crystal X-ray analysis was carried out for complexes 2 and 4. Single X-ray structures of 2 and 4 showed that zinc is five coordinated with four sulphur from dithiocarbamate and one nitrogen from pyridine. The coordination geometry of complexes 2 and 4 suggest distorted square pyramid. Cyclic voltammogram of complex 2 exhibit one oxidation wave at 1.1013 V and only one reduction wave at 0.7387 V.

Key words: Dithiocarbamate; Single Crystal X-Ray Structural Analysis; Anion Sensing.

1. Introduction

Dithiocarbamates are widely used as reagent in organic synthesis, medicine, biology and other field of science [1-11]. The most widespread use of dithiocarbamates is found in the rubber industry where they are used as vulcanization accelerators. At the same time, they have good antioxidant properties which makes them even more valuable. These antioxidant properties are also put to good use in greases and oils. Dithiocarbamates are used as fungicides.

Dithiocarbamates and their complexes have been widely used as antibacterial agents [12]. Dithiocarbamates containing piperazine [13], piperidine [14], saccharin [15], imidazoles [16],

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Synthesis and characterization of copper sulfide and copper-iron sulfide nanoparticles

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Abstract

Copper sulfide and copper-iron sulfide nanoparticles were prepared from bis(N-(pyrrol-2-ylmethyl)-N-butylthiocarbamate-S,S')copper(II) (**1**) and bis(N-methylferrocenyl-N-(2-phenylethyl)dithiocarbamate-S,S')-copper(II) (**2**), respectively and they were characterized by PXRD, TEM, EDS, UV-Vis, photoluminescence and FT-IR spectroscopy. The TEM images of copper-iron sulfide reveals that the particles are spherical and oval shaped, respectively. Photocatalytic activities of as-prepared nanoparticles were studied by decolourization of methylene blue and rhodamine-B under ultraviolet light. It was found that the copper-iron sulfide degrades methylene blue and rhodamine-B much better than copper sulfide.

Keywords: Copper(II) Dithiocarbamates; Copper Sulfide; Copper-Iron Sulfide; Photodegradation.

1. Introduction

Dithiocarbamate ligands, have found ample use in coordination chemistry [1,2]. Their wide range of applications e.g. industry, agriculture and medicine has generated a large collection of crystallographic data for their metal complexes [3]. Dithiocarbamates are versatile ligands capable of stabilizing transition metals in both high and low oxidation states [4] and complexes of Cu(I), Cu(II) and Cu(III) are all known, being inter conversable via reversible one-electron redox process [5]. Metal sulfides can also serve as an important semiconductor

Copper(II) dithiocarbamate complexes (**1** and **2**) containing pyrrole and ferrocene moieties were prepared and characterized. This study demonstrates spherical shape copper sulfide and copper-iron sulfide and oval shape copper-iron sulfide can be prepared from copper dithiocarbamate complexes. Copper-iron sulfide (bimetallic) nanoparticles revealed better photocatalytic activity for the photo degradation of methylene blue and rhodamine-B under UV light compared to copper sulfide (monometallic). This study indicates that preparation of new copper(II) dithiocarbamate complexes containing various N-bound organic moiety is useful for sensing anions and preparing effective photocatalysts (copper sulfide and copper-iron sulfide nanoparticles with various shape).

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Spectral And Structural Studies On Nickel(II) Dithiocarbamate Complexes And Their Utility For Sensing Anions

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Abstract

Bis(N-(pyrrol-2-ylmethyl)-N-butyl)dithiocarbamate-S,S'nickel(II) (**1**) and bis(N-methylferrocenyl-N-(2-phenylethyl)dithiocarbamate-S,S'nickel(II) (**2**) have been prepared and characterized by IR, and UV-visible absorption spectra. The electrochemical anion sensing ability of bis(N-(pyrrol-2-ylmethyl)-N-butyl)dithiocarbamate-S,S'nickel(II) (**1**) and bis(N-methylferrocenyl-N-(2-phenylethyl)dithiocarbamate-S,S'nickel(II) (**2**) toward F^- , Cl^- , Br^- and I^- was investigated. Cyclic voltammogram of **1** shows a peak at -0.8416 V which corresponds to the normally observed and well documented Ni(II)/Ni(I) reduction (one electron addition). The addition of F^- , Cl^- , Br^- and I^- anions to electrochemical solutions of the complex **1** resulted in a significant shift in the Ni(II)/Ni(I) reduction potential.

Keywords: Nickel (II) dithiocarbamate, Spectral Studies, Anion Sensing.

1. Introduction

Dithiocarbamates are widely used as reagent in organic synthesis, medicine, biology and other field of science [2, 11]. The most widespread use of dithiocarbamates is found in the rubber industry where they are used as vulcanization accelerators. At the same time, they have good antioxidant properties which makes them even more valuable. These antioxidant properties are also put to good use in greases and oils. Dithiocarbamates are used as fungicides.

Dithiocarbamates and their complexes have been widely used as antibacterial agents [12]. Dithiocarbamates containing piperazine [13], piperidine [14], saccharin [15], imidazoles [16],

Synthesis and characterization of cobalt sulfide and cobalt-iron sulfide nanoparticles from cobalt(III) dithiocarbamate complexes and their utility for photocatalytic degradation of dyes

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Abstract

Tris(N-(pyrrol-2-ylmethyl)-N-butylthiocarbamate-S,S')cobalt(III) (1), bis(N-methylferrocenyl-N-(2-phenylethyl)dithiocarbamate-S,S')nickel(II) (2) complexes were used as single source precursors for the preparation of cobalt sulfide and cobalt-iron sulfide nanoparticles. Morphological characterization of nanoparticles was carried out using TEM and the optical properties by UV-vis and photoluminescence spectroscopic techniques. The elemental compositions of the nanoparticles were confirmed by energy dispersive X-ray spectroscopy. IR spectral studies on nanoparticles confirm the presence of capping agent (triethylenetetramine). The nanoparticles are explored as photocatalysts to study the degradation of dyes using methylene blue and rhodamine-B in aqueous solution under UV irradiation. The cobalt-iron sulfide works as an efficient photocatalyst for degradation of rhodamine-B.

Keywords: Cobalt(III) dithiocarbamate; cobalt sulfide; cobalt-iron sulfide; nanoparticles; single source precursors

1. Introduction

A wide range of metal-dithiocarbamate complexes is known with examples finding use in applications as diverse as industry, agriculture, medicine and material science [1-7]. Metal sulfide nanoparticles have shown vital applications in many fields as an advanced materials such as IR detectors [6], photocapacitors for energy conversion and storage [7], sensors [8], photonic materials [9] and advanced optoelectronic devices [10]. In recent years, transition metal

dithiocarbamate complexes have received a great deal of attention because of their importance as single source precursors for the preparation of metal sulfide nanoparticles [11,12].

2. EXPERIMENTAL

2.1 Materials and instrumentation

Reagent grade chemicals were procured from commercial sources and used as such. The synthesis of the compounds was carried out under an inert-gas atmosphere of nitrogen. Solvents were purified according to standard procedures and dried before use whenever required. IR spectra were recorded on a thermo NICOLET AVATAR 330 FT-IR spectrophotometer. The $^1\text{H}/^{13}\text{C}$ NMR spectra were recorded on BRUKER 400/100 MHz NMR spectrometer at room temperature in CDCl_3 solvent. SHIMADZU UV-1650 PC double beam UV-visible spectrophotometer was used for recording the electronic spectra of the complexes.

2.2. Photocatalytic experiments

The photocatalytic activity of cobalt sulfide and cobalt-iron sulfide was evaluated by degradation of aqueous solution of methylene blue and rhodamine-B. All the solutions were prepared using double distilled water. A typical photocatalytic experiments, 0.1 g of catalyst was added to 50 ml of an aqueous solution of rhodamine-B in the concentration of 1.0×10^{-4} M. The solution was maintained under darkness for 30 min to reach dye solution adsorption-desorption equilibrium. The solution with the suspended nano-photocatalyst was irradiated by UV light from mercury vapour lamp. At given time intervals, 3ml of aliquots was withdrawn and centrifuged to remove catalyst, concentration of both dye solution was determined with the help of UV-vis spectrophotometer.

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Analysis of Catastrophic Feedback Queue with Balking and Reneging

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Abstract: This paper studies the stationary analysis of a catastrophic feedback M/M/1 queueing model where the system undergoes balking and retaining impatient customers. The steady-state system size probabilities are obtained using the method of generating function.

Keywords: Single server queue; Feedback; Balking; Catastrophe; Retaining impatient customers

1. INTRODUCTION

In computer and communication systems, manufacturing industries, service systems, telecommunication networks, etc., there are many situations where the system undergoes catastrophes. When the server is busy, catastrophe may occur at any instant. As a result, all the customers in the system are getting eliminated. Then the server behaves as a new one and is immediately ready to serve any arriving new customers. When the system is non empty, the arriving customers decide either to join the queue for service or not to join the queue (balking) as the queue has more number of customers waiting for service. After getting the service, if a customer is not satisfied with the quality of service, he/she may decide either to enter into the queue for another service (feedback) or to leave the system. The impatience of customers is due to the long waiting time of customers in the queue for service. From the business point of view, it is very important to analyze in retaining the impatient customers from moving out of the system. Otherwise, the trading center may face loss in business due to the (impatient) customers' loss.

Yechiali (2007) derived the system size probabilities for the Markovian queueing models with single, multiple and infinite servers cases in the stationary case, where the system undergoes disastrous breakdown and impatience of customers is due to disasters. The stationary solution for an M/M/1 queue was obtained by Selvaraju and Goswami (2013) where the customers in the queue, waiting for service, become impatient during working vacations. But the one in service does not become impatient. Sudhesh and Azhagappan (2016) investigated the impatience of customers in an M/M/1 vacation queueing model where the server waits dormant in the system for a certain period after returning from vacation. Sudhesh et al. (2017) described the M/M/1 model in which the server starts working vacation (single and multiple) whenever the busy

Transient Behavior of a Markovian Queue with Multiple Working Vacation and Variant Reneging

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Abstract: This paper studies the transient analysis of an M/M/1 queue with multiple working vacations and customers' variant impatient behavior. The time-dependent system size probabilities are derived explicitly using generating function and continued fraction.

Keywords: M/M/1 queue; Multiple working vacation; Impatient customers

1. INTRODUCTION

In our model, we consider the customer under service, during working vacation, never becomes impatient but only the ones waiting in queue abandon the system due to impatience. This type of situation can be seen in reality as a customer receiving service never wants to abandon the system. Servi and Finn (2002) introduced the M/M/1 queueing model with working vacations where a customer is served at a lower rate instead of stopping the service completely. Altman and Yechiali (2006) presented a detailed analysis of some single-server queues such as M/M/1, M/G/1 queues and the multi-server M/M/c queue, for both the multiple and the single vacation policies in the presence of impatience nature of customers.

Selvaraju and Cosmika Goswami (2013) derived the steady-state solution for an M/M/1 queueing model with working vacation and customers impatience with an additional condition that the customer under service, during working vacation, never becomes impatient. But only the customers waiting in the queue during working vacation, abandon the system due to impatience. Sudhesh and Azhagappan (2016) investigated the impatience of customers in an M/M/1 vacation queueing model where the server waits dormant in the system for certain period after returning from vacation. Sudhesh et al. (2017) described the M/M/1 model in which the server starts working vacation (single and multiple) whenever the busy period ends and the customers possess impatience behavior during working vacation. They have derived the system size probabilities explicitly using continued fraction for the transient case.

2. MODEL DESCRIPTION

Consider an M/M/1 queueing model with multiple working vacation and impatient customers. Customers arrive according to the Poisson process with rate λ and the service times are exponentially distributed with rate μ_1 . Whenever the system becomes empty, the server

starts a working vacation. An arrival, during the working vacation period, will get the service at a rate μ_0 (less than μ_1) which follows exponential distribution. The server vacation time is exponential random variable with parameter γ . If the server finds an empty system after the completion of working vacation, another working vacation begins. The customers who arrive during a working vacation period and find the system is not empty, become impatient. A customer who arrives during a working vacation period and find the server free, gets his service immediately upon his arrival and therefore he does not become impatient.

Assume that inter-arrival times, service times in the vacation period, service times in the busy period and vacation times are all independent. The service discipline is first-come-first-served (FCFS). During the working vacation period, customers become impatient. That is, each individual customer activates an independent impatience timer, exponentially distributed with parameter ξ such that the customer's service has not been completed before the customer's timer expires, he/she abandons the system never to return.

Let $\{X(t), t \geq 0\}$ be the number of customers in the system at time t and $R(t)$ be the status of the server at time t , which is defined as follows:

$R(t) = 0$, if the server is in multiple working vacation with service rate μ_0
 $= 1$, if the server is busy with service rate μ_1 at time t .

Then $\{X(t), R(t), t \geq 0\}$ is a continuous time Markov chain on the state space $S = \{0, 0\} \cup \{n, r; n = 1, 2, \dots; r = 0 \text{ or } 1\}$. Let

$$P_{0,n}^*(t) = P\{X(t) = n, R(t) = 0\}, n = 0, 1, 2, \dots$$

$$P_{1,n}^*(t) = P\{X(t) = n, R(t) = 1\}, n = 1, 2, 3, \dots$$

The set of forward Kolmogorov differential difference equations are

$$P_{0,0}'(t) = -\lambda P_{0,0}(t) + \mu_1 P_{1,1}(t) + \mu_0 P_{0,1}(t),$$

$$P_{0,1}'(t) = \lambda P_{0,0}(t) - (\lambda + \mu_0 + \gamma) P_{0,1}(t) + (\mu_0 + \xi) P_{0,2}(t), \quad (1)$$

$$P_{0,n}'(t) = \lambda P_{0,n-1}(t) - (\lambda + \mu_0 + (n-1)\xi + \gamma) P_{0,n}(t) + (\mu_0 + n\xi) P_{0,n+1}(t), n \geq 2, \quad (2)$$

$$P_{1,1}'(t) = -(\lambda + \mu_1) P_{1,1}(t) + \mu_1 P_{1,2}(t) + \gamma P_{0,1}(t), \quad (3)$$

$$P_{1,n}'(t) = -(\lambda + \mu_1) P_{1,n}(t) + \lambda P_{1,n-1}(t) + \mu_1 P_{1,n+1}(t) + \gamma P_{0,n}(t), n \geq 2, \quad (4)$$

$$P_{0,0}(0) = 1. \quad (5)$$

2.1 Transient Probabilities

In this section, we derive the time-dependent system size probabilities of the model considered using generating function and continued fraction.

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Experimental FTIR, FT-Raman, Quantum Computational Vibrational Spectroscopic and Molecular Docking study of 4-Oxo-4H-Chromone-3-Carboxaldehyde

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Abstract

In this present work, the theoretical vibrational frequencies of 4-oxo-4H-chromone-3-carboxaldehyde also known as 3-Formylchromone (3FC) have been calculated by HF and DFT (B3LYP) methods with the basis set 6-311G++ (d, p) and the experimental FT-IR and FT-Raman spectra of the titled molecule is also recorded in the region 4000 - 400 cm^{-1} . The calculated vibrational frequencies are scaled and compared with the experimentally observed spectra; a detailed assignment of the vibrational spectra of the titled molecule is carried out. The HOMO-LUMO and Natural Bonding Orbital (NBO) analysis of the titled compound have been performed to understand the charge transfer and conjugative interaction in the molecule system respectively. Molecular Electrostatic Potential (MEP) analysis of the 3FC also studied to understand the nucleophilic, electrophilic reactive sites and hydrogen bonding interaction. Mulliken atomic charge of the chosen compound is also computed to understand the preferred position of the nucleophilic and site selectivity. The drug bioavailability and drug likeness properties of the 3FC have also been calculated to understand the pharmaceutical molecular properties. Moreover, molecular docking study is also carried out on the optimized structure of 3FC to predict the binding affinity with protein. This study reveals that the titled compound possess a better binding affinity with residues of the Human NAA50 cell line, mitogen activated protein kinase-p38delta and Human NAD (P) H-quinone oxidoreductase. Therefore, this study provides a profound knowledge about the design of the drug related with this protein in the pharmaceutical industry.

Keywords: FT-Raman; FT-IR; HOMO- LUMO; MEP; NBO.

Introduction:

Biological activity mainly depends upon on the molecular structure and hence the relationship between molecular structure and biological activity can be understood with the knowledge of the complete vibrational spectrum. Chromone is the parent compound of flavonoids which imbibes oxygen naturally and is found in normal human diet¹. Most of the natural and synthetic chromone derivatives have found wide range of biological application². The title compound 3FC with chemical formula $\text{C}_{10}\text{H}_6\text{O}_3$ is a benzo- -pyrone, substituted by an aldehyde group in the position C-3. The 3FC is plays the significant role in various chemical reactions as reduction, oxidation, radical nucleophilic addition, many types of annulations, cycloaddition reactions and shows an assorted building block in synthesis of heterocycles compound^{3, 4}. Depending on the nature of the functional group present at the position three, the 3FC is a versatile synthons for the synthesis of a variety of novel heterocyclic derivatives possessing diverse biological applications such as antifungal, anti-

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The Importance of Pronunciation in English Language Teaching

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Abstract

English Pronunciation instruction is difficult for some reasons. Teachers are left with clear guidelines and are faced with contradictory practices for pronunciation instruction. There is no well-established systematic method of deciding what to teach, when, and how to teach it. As a result of these problems, pronunciation instruction is less important and teachers are not very comfortable in teaching pronunciation in their classes. This paper reviews some of the important issues of English pronunciation instruction. The aims of this paper are to define the term pronunciation, discuss the goal of pronunciation instruction, explain the importance of pronunciation instruction, elaborate the role of teachers in teaching pronunciation, and finally mention some suggestions in helping teachers to improve learners' pronunciation. A review of literature shows that if teachers want to teach pronunciation accurately they should be trained in pronunciation instruction.

Keywords: pronunciation, goal, importance, role, suggestions

1. INTRODUCTION

English pronunciation is one of the most difficult skills to acquire and learners should spend lots of time to improve their pronunciation (Aliaga García, 2007; Martínez-Flor et al., 2006; Pourhosein Gilakjani, 2016). Understandable pronunciation is one of the basic requirements of learners' competence and it is also one of the most important features of language instruction. Good pronunciation leads to learning while bad pronunciation promotes great difficulties in language learning (Pourhosein Gilakjani, 2012).

According to Fraser (2000), teachers should be provided with courses and materials that help them improve their pronunciation instruction. She continued that second language education research should not be concerned with the significance of English pronunciation instruction but with the methodology of pronunciation instruction. Morley (1991) stated that understandable pronunciation is a main objective of pronunciation instruction. It is a necessary component of communicative competence.

Morley (1991) emphasized that learners should develop functional intelligibility, functional communicability, increased self-confidence, the speech monitoring abilities, and speech modification strategies. In this paper, the researcher defines the term pronunciation,

Teaching and Learning English for Engineering Students

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Abstract: Proficiency in English is very important for students of Engineering and other professional courses because it is the medium of instruction in higher academics besides being the lingua Franca of all global transactions. It is a welcome development that people in the field of technical and professional education have now recognized the emerging scenario and are supporting the view that English is the dominant language of science and technology and an indispensable part in an engineer's professional training.

However through a study of secondary data and published literature on the subject of English language proficiency of engineering students in the Indian context and first hand observation by the authors themselves it is observed that in spite of intervention programs, an overwhelming number of our graduating engineers lack appropriate proficiency in English, which frustrates their attempt to acquire the required communication skills in order to be employable.

This paper therefore explores the significant factors and their impact on the communicative proficiency of engineering students in India.

Key words: Proficiency, Communication Skills, Fluency, Employability Skills,

I. INTRODUCTION

Proficiency in English is essential for students of Engineering and other professional courses because it is the medium of instruction in all higher academics and it is widely used as the medium of communication in all offices within our country. English is also the predominant language for international commerce, trade, international relations, tourism, science, technological research, and education. Engineering students have to use English to deal comprehensively with the countless lectures conducted in English, comprehend countless sentences and paragraphs written in English in the engineering text books and reference books, tutorials, projects and dissertation papers. Academic success therefore is predominantly dependant on English language proficiency of the students. Besides that the world is increasingly becoming a small place and job opportunities are not just limited to India alone, thus competence in English is very important for the engineering students in India, not only for their academic career but also for their prospective professional life. With this background it is pertinent to explore the teaching-learning process effectiveness and the perspectives on the proficiency in English for our engineers.

THE NATIONAL PERSPECTIVE

From Indian national development perspective proficiency in English for scientists and engineers is important English as it is the dominant language of science and technology. Proficiency in English is also important for the academics and research both as a good number of the scientific papers or journals in the world are written in English. English as an international language of science (EILS) has led some users to enjoy preferred treatment and status. Hence it is imperative that our students have the requisite proficiency in English if we want our country to occupy leadership position in the field of science and technology.

THE INDIVIDUAL PERSPECTIVE

Decades ago it was generally believed that engineers were to do technical things behind stage and therefore did not need any higher level of proficiency in English. The engineering curriculum therefore didn't give any emphasis to developing communication skills in English. With India fast becoming a global economy and English being the language of global business, the Indian companies are increasingly focusing on English language skills of employment seeking candidates. Moreover, English is the medium of interpersonal communication in the corporate and therefore having good command on English language has become even

more crucial. Engineers usually work in groups and this very nature of their work demands mutual cooperation and effective interpersonal communication within and outside the organization in order to understand and coordinate with co-workers and accomplish their projects. To be able to do so engineers need to possess high level of listening comprehension, speaking and reading fluency and good writing skills in English. It would be squarely wrong to depend solely on technical knowledge and skills, which could be less than adequate due to lack of language comprehension and production skills in English, to progress in one's professional career. Good communication skills in English and sound domain knowledge is also crucial to make the most out of the globalised job market

II. SURVEY ON ENGLISH PROFICIENCY OF INDIAN ENGINEER-ASPIRANTS

The need for engineering students to acquire communication skills along with technical skills, to facilitate career success and community engagement has been increasingly communicated by educators and industry professionals alike. Various essential communication skills mentioned include conflict resolution, teamwork, and awareness of social justice, ethics and sustainability. However, as highlighted by Adams and Missingham (2006) the need for improved communicative competence in engineering graduates has been the most widely discussed in research and the engineering profession. Engineers increasingly work in knowledge-intensive fields that require both problem-solving skills and high level communication (Alvesson 2004). Riemer (2002) claims the graduate engineer must be able to present this knowledge with an excellent standard of communication skills along with engineering knowledge and technical expertise.

According to Najar (2002) "communicative competence, including teamwork and professional writing skills for example, the ability to research, write and format basic research reports as well as develop formal oral presentation skills is important to prepare students for both academic success and the workplace." Kang Shumin says: "Learning to speak a foreign language requires more than knowing its grammatical and semantic rules". He further opines that: "Learners must also acquire knowledge of how native speakers use the language in the context of structured interpersonal exchange, in which many factors interact".

Communication is a multidisciplinary activity that encompasses broad areas such as listening, speaking, reading, and writing. Effective communication skill is an essential for the engineer. It is not only the academics but engineers require effective communication as an essential employability skill in the competitive global work arena. Unfortunately reviews show that this very skill is severely lacking, subsequently affecting the general employability of engineering students.